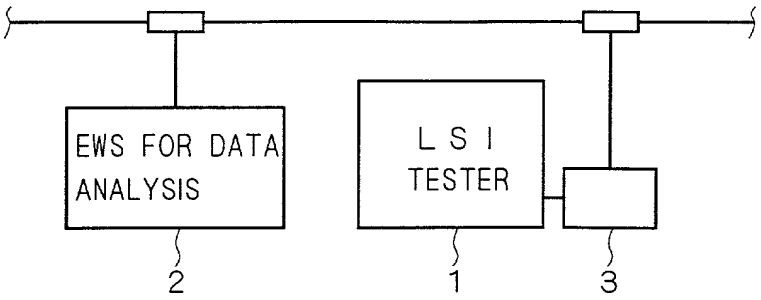
FIG. 1



US2003-0229838

FIG. 2

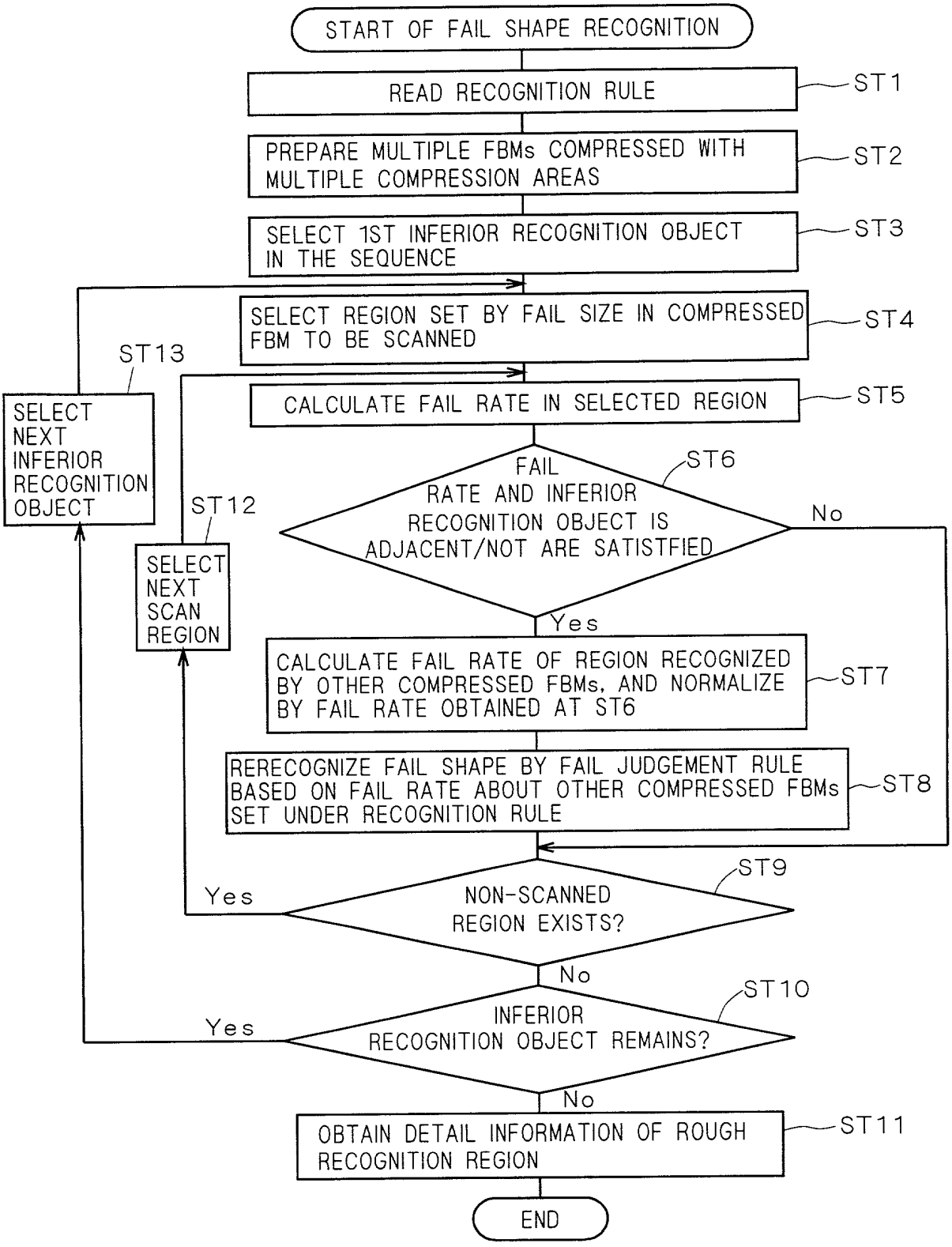
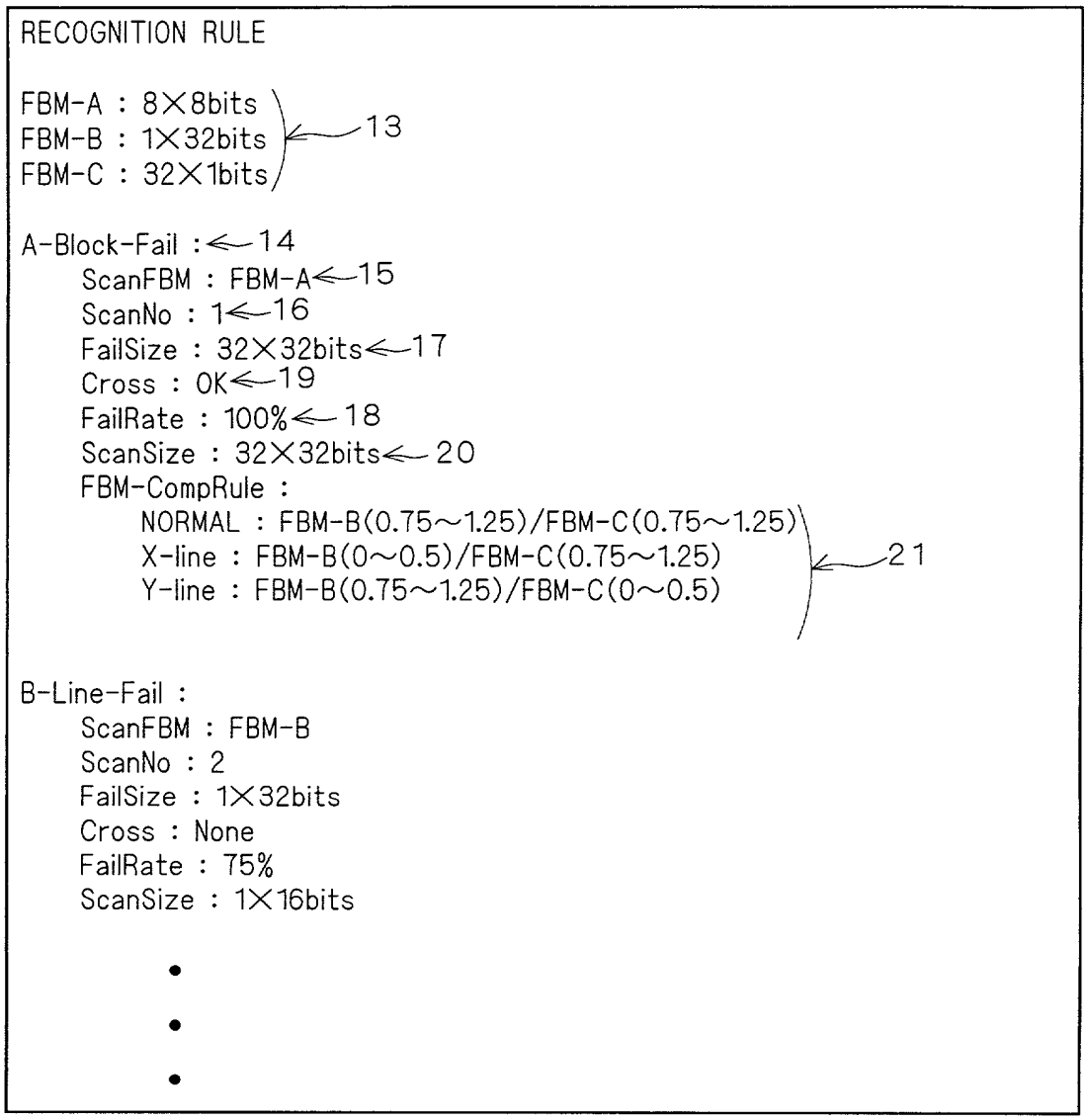

START OF FAIL SHAPE RECOGNITION
READ RECOGNITION RULE
ST1
PREPARE MULTIPLE FBMs COMPRESSED WITH MULTIPLE COMPRESSION AREAS
ST2
SELECT 1ST INFERIOR RECOGNITION OBJECT IN THE SEQUENCE
ST3
SELECT REGION SET BY FAIL SIZE IN COMPRESSED FBM TO BE SCANNED
ST4
CALCULATE FAIL RATE IN SELECTED REGION
ST5
FAIL RATE AND INFERIOR RECOGNITION OBJECT IS ADJACENT/NOT ARE SATISTFIED
ST6
No
Yes
CALCULATE FAIL RATE OF REGION RECOGNIZED BY OTHER COMPRESSED FBMs, AND NORMALIZE BY FAIL RATE OBTAINED AT ST6
ST7
RERECOGNIZE FAIL SHAPE BY FAIL JUDGEMENT RULE BASED ON FAIL RATE ABOUT OTHER COMPRESSED FBMs SET UNDER RECOGNITION RULE
ST8
NON-SCANNED REGION EXISTS?
ST9
Yes
No
INFERIOR RECOGNITION OBJECT REMAINS?
ST10
Yes
No
OBTAIN DETAIL INFORMATION OF ROUGH RECOGNITION REGION
ST11
END
SELECT NEXT SCAN REGION
ST12
SELECT NEXT INFERIOR RECOGNITION OBJECT
ST13

FIG. 3



US-2003-0229828-A1

FIG. 4C

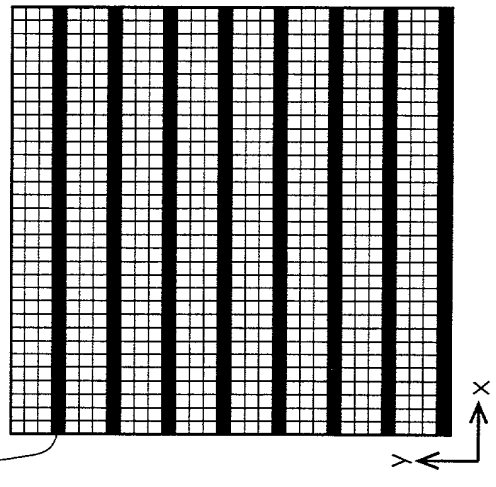


FIG. 4B

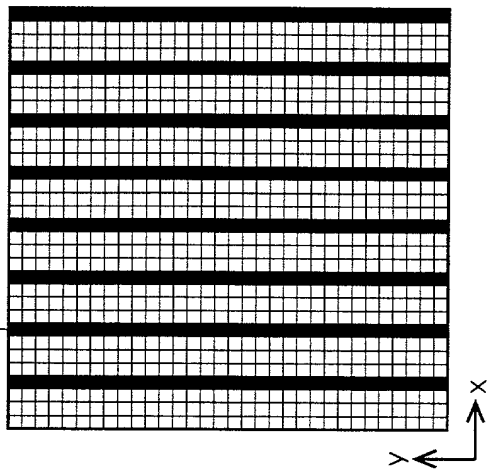
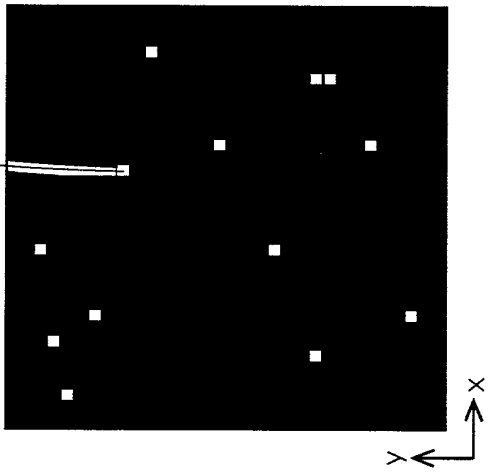


FIG. 4A



JP2005-285209

FIG. 5A

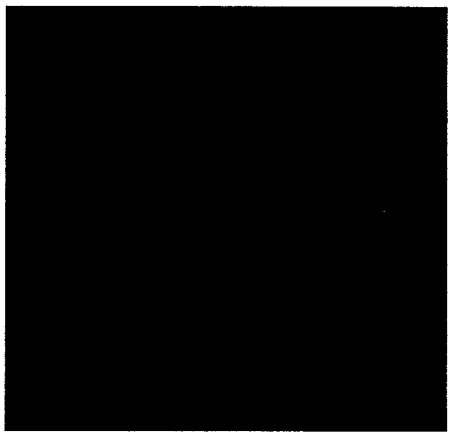


FIG. 5B

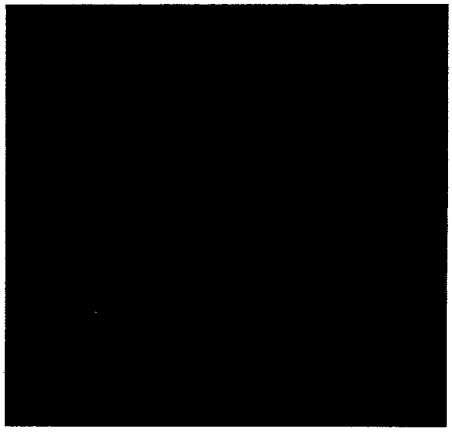
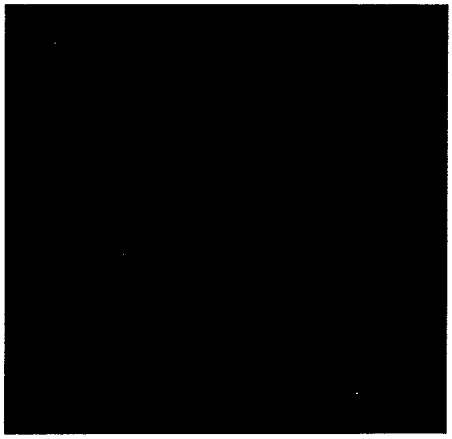


FIG. 5C



D3S3E-B3B3S3D

FIG. 6C

FIG. 6B

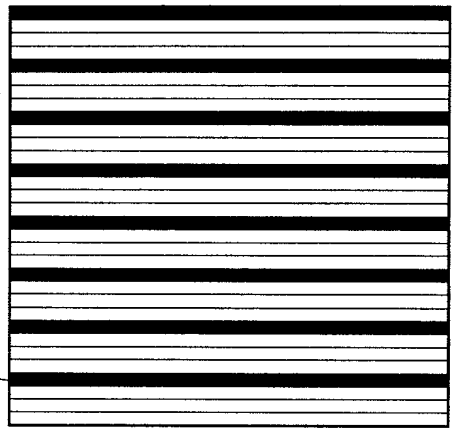


FIG. 6A

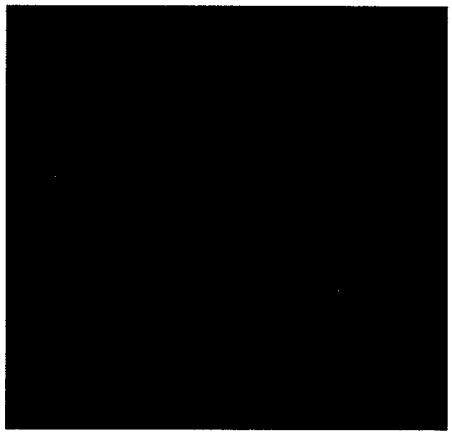


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FIG. 7C

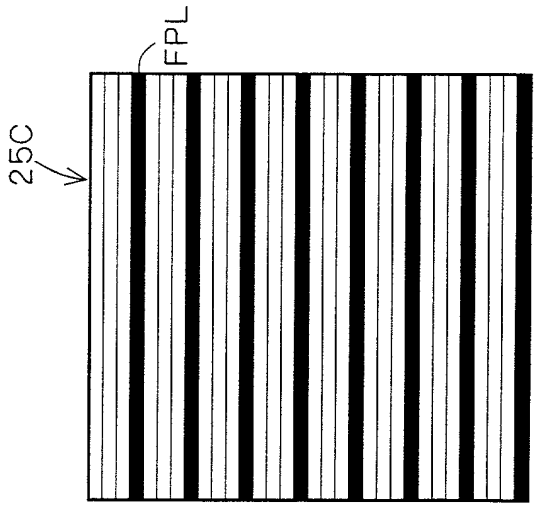

FIG. 7B

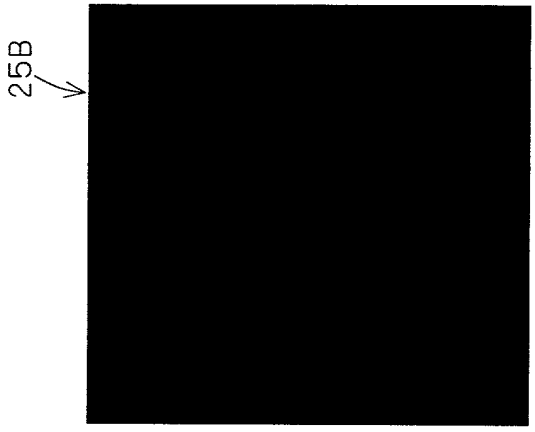

FIG. 7A

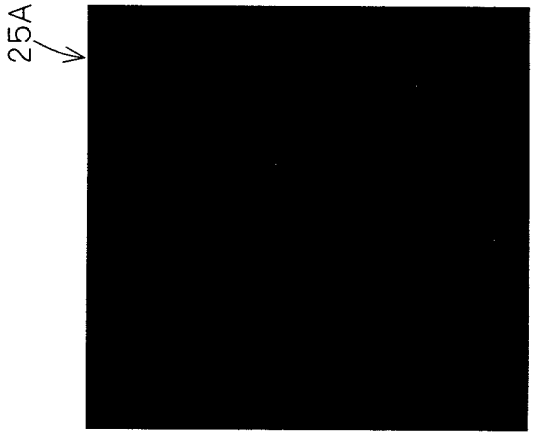

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FIG. 8

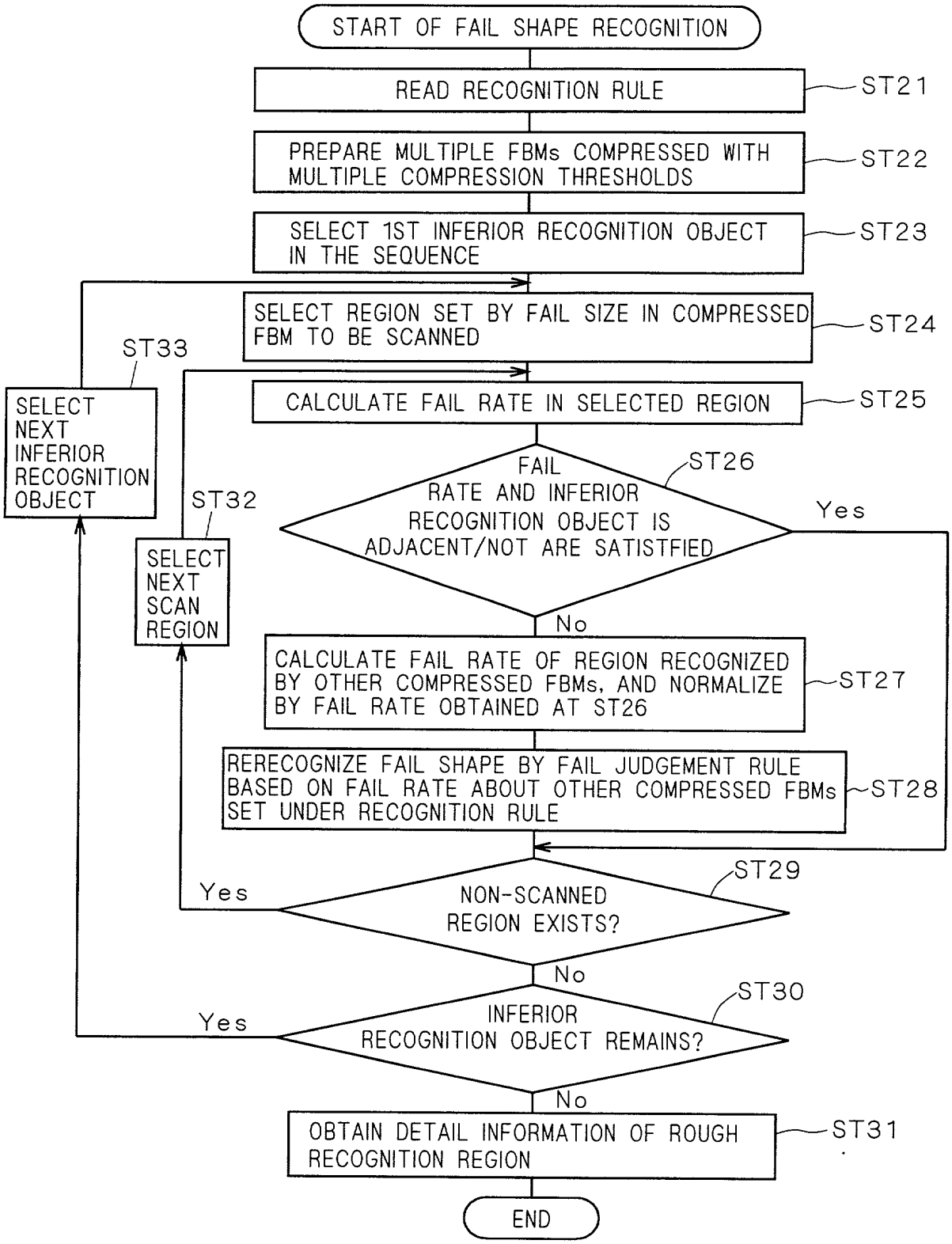

START OF FAIL SHAPE RECOGNITION
READ RECOGNITION RULE
ST21
PREPARE MULTIPLE FBMs COMPRESSED WITH MULTIPLE COMPRESSION THRESHOLDS
ST22
SELECT 1ST INFERIOR RECOGNITION OBJECT IN THE SEQUENCE
ST23
SELECT REGION SET BY FAIL SIZE IN COMPRESSED FBM TO BE SCANNED
ST24
CALCULATE FAIL RATE IN SELECTED REGION
ST25
FAIL RATE AND INFERIOR RECOGNITION OBJECT IS ADJACENT/NOT ARE SATISTFIED
ST26
Yes
No
CALCULATE FAIL RATE OF REGION RECOGNIZED BY OTHER COMPRESSED FBMs, AND NORMALIZE BY FAIL RATE OBTAINED AT ST26
ST27
RERECOGNIZE FAIL SHAPE BY FAIL JUDGEMENT RULE BASED ON FAIL RATE ABOUT OTHER COMPRESSED FBMs SET UNDER RECOGNITION RULE
ST28
NON-SCANNED REGION EXISTS?
ST29
Yes
No
INFERIOR RECOGNITION OBJECT REMAINS?
ST30
Yes
No
OBTAIN DETAIL INFORMATION OF ROUGH RECOGNITION REGION
ST31
END
SELECT NEXT INFERIOR RECOGNITION OBJECT
ST33
SELECT NEXT SCAN REGION
ST32

FIG. 9

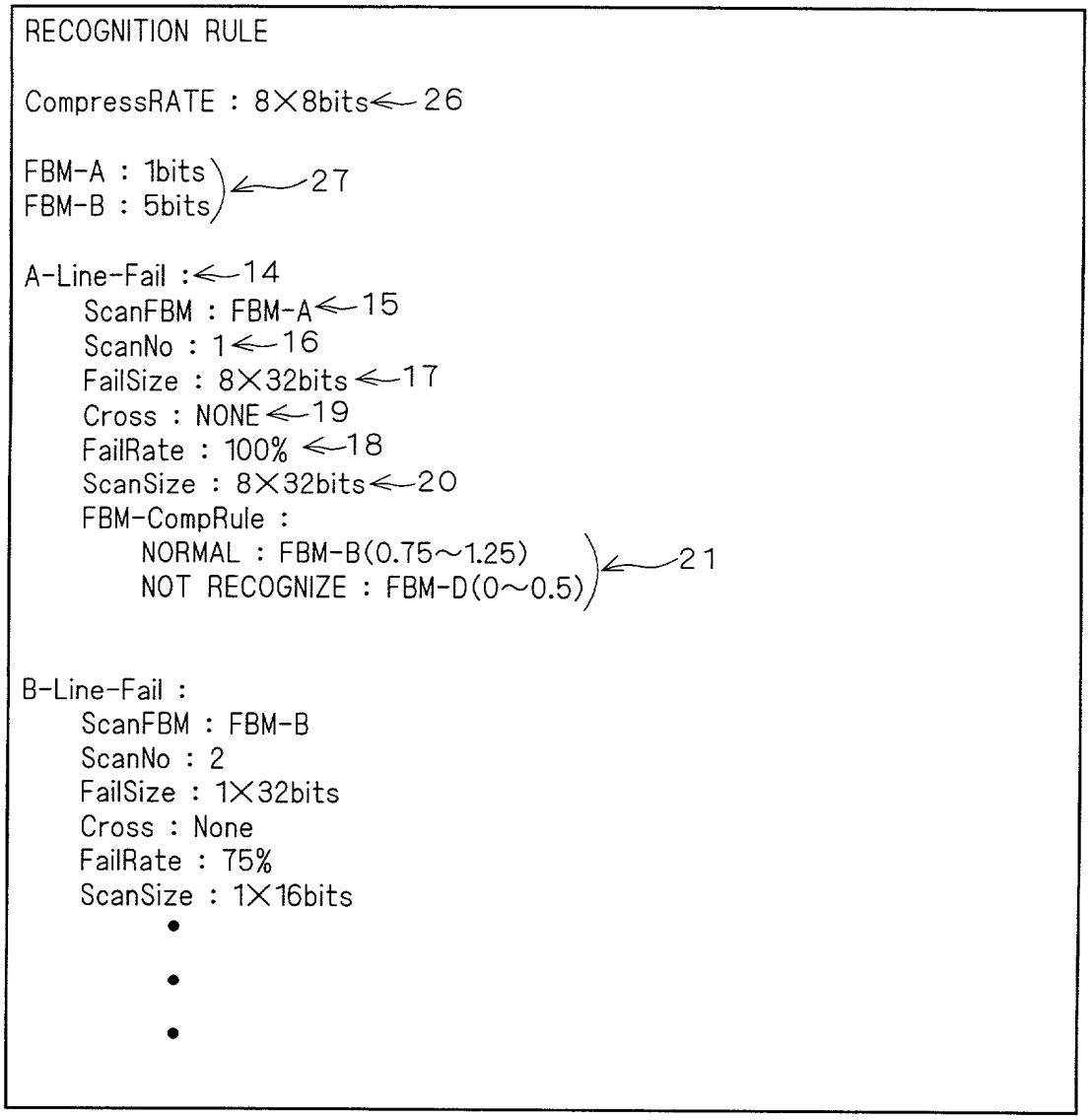

RECOGNITION RULE
CompressRATE : 8×8bits
26
FBM-A : 1bits
FBM-B : 5bits
27
A-Line-Fail :
14
ScanFBM : FBM-A
15
ScanNo : 1
16
FailSize : 8×32bits
17
Cross : NONE
19
FailRate : 100%
18
ScanSize : 8×32bits
20
FBM-CompRule :
NORMAL : FBM-B(0.75~1.25)
NOT RECOGNIZE : FBM-D(0~0.5)
21
B-Line-Fail :
ScanFBM : FBM-B
ScanNo : 2
FailSize : 1×32bits
Cross : None
FailRate : 75%
ScanSize : 1×16bits

FIG. 10A

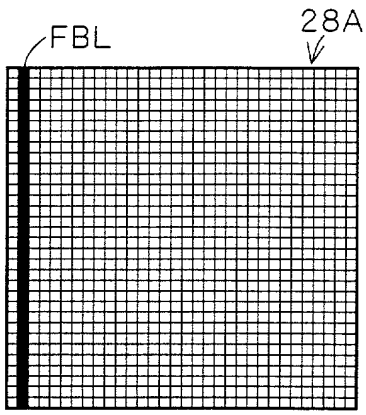


FIG. 10B

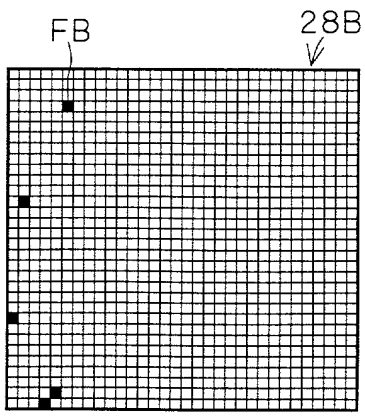


FIG. 11A

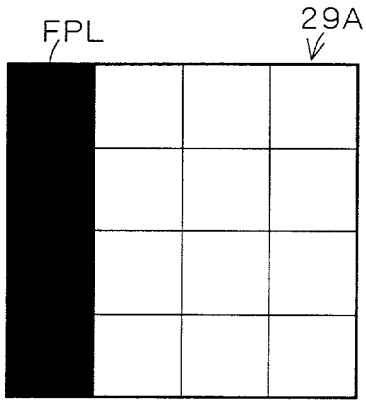


FIG. 11B

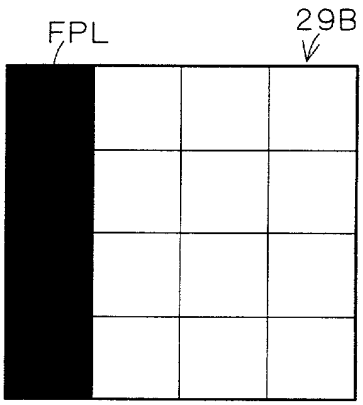


FIG. 12A

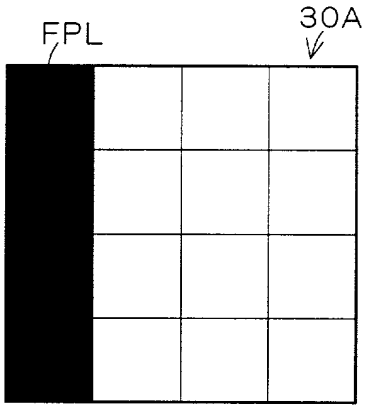
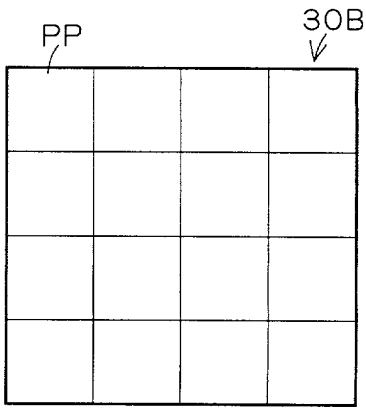


FIG. 12B



US2008-0252650

FIG. 13

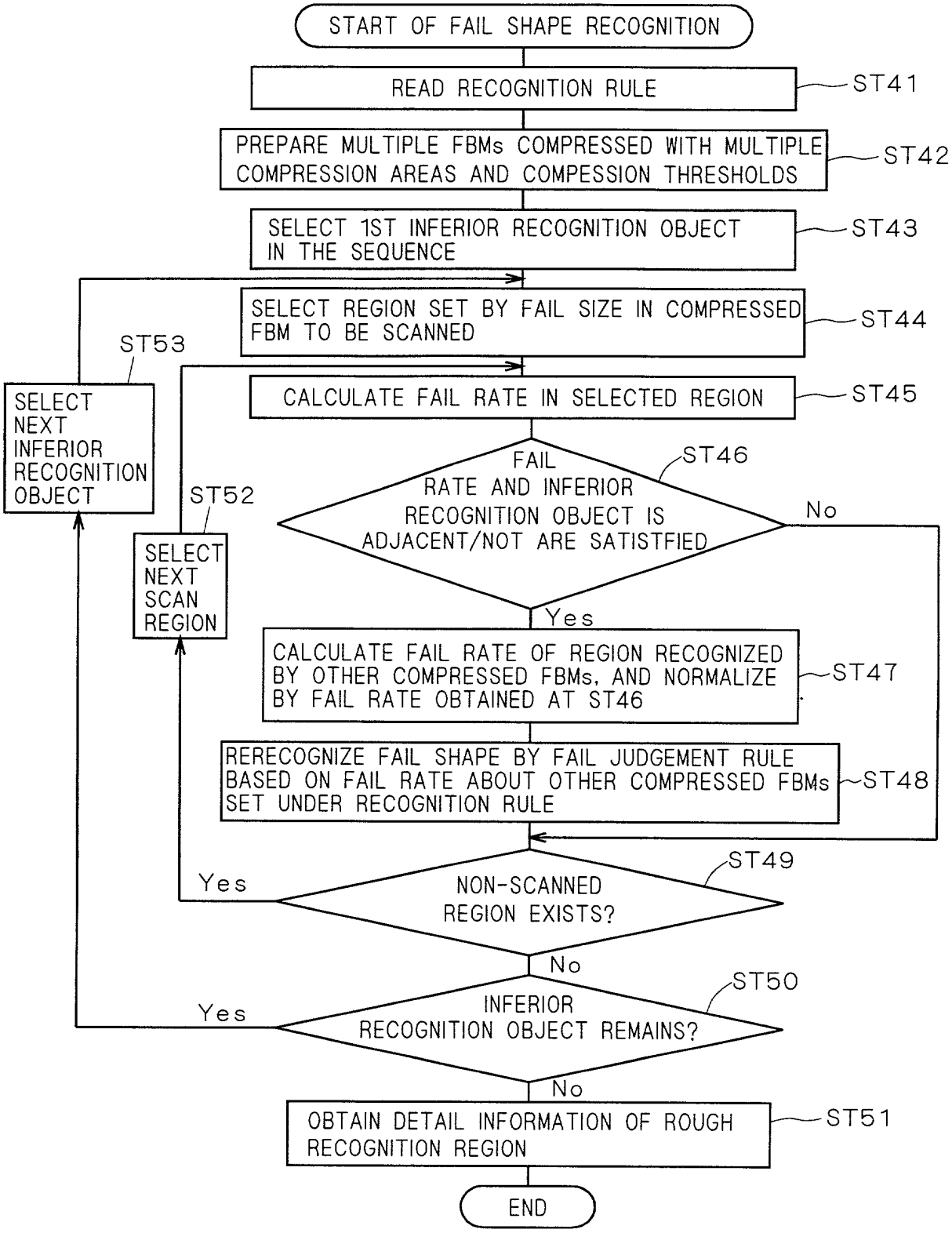

START OF FAIL SHAPE RECOGNITION
READ RECOGNITION RULE
ST41
PREPARE MULTIPLE FBMs COMPRESSED WITH MULTIPLE COMPRESSION AREAS AND COMPESSION THRESHOLDS
ST42
SELECT 1ST INFERIOR RECOGNITION OBJECT IN THE SEQUENCE
ST43
SELECT REGION SET BY FAIL SIZE IN COMPRESSED FBM TO BE SCANNED
ST44
ST53
SELECT NEXT INFERIOR RECOGNITION OBJECT
CALCULATE FAIL RATE IN SELECTED REGION
ST45
FAIL RATE AND INFERIOR RECOGNITION OBJECT IS ADJACENT/NOT ARE SATISTFIED
ST46
No
ST52
SELECT NEXT SCAN REGION
Yes
CALCULATE FAIL RATE OF REGION RECOGNIZED BY OTHER COMPRESSED FBMs, AND NORMALIZE BY FAIL RATE OBTAINED AT ST46
ST47
RERECOGNIZE FAIL SHAPE BY FAIL JUDGEMENT RULE BASED ON FAIL RATE ABOUT OTHER COMPRESSED FBMs SET UNDER RECOGNITION RULE
ST48
ST49
Yes
NON-SCANNED REGION EXISTS?
No
ST50
Yes
INFERIOR RECOGNITION OBJECT REMAINS?
No
OBTAIN DETAIL INFORMATION OF ROUGH RECOGNITION REGION
ST51
END

FIG. 14

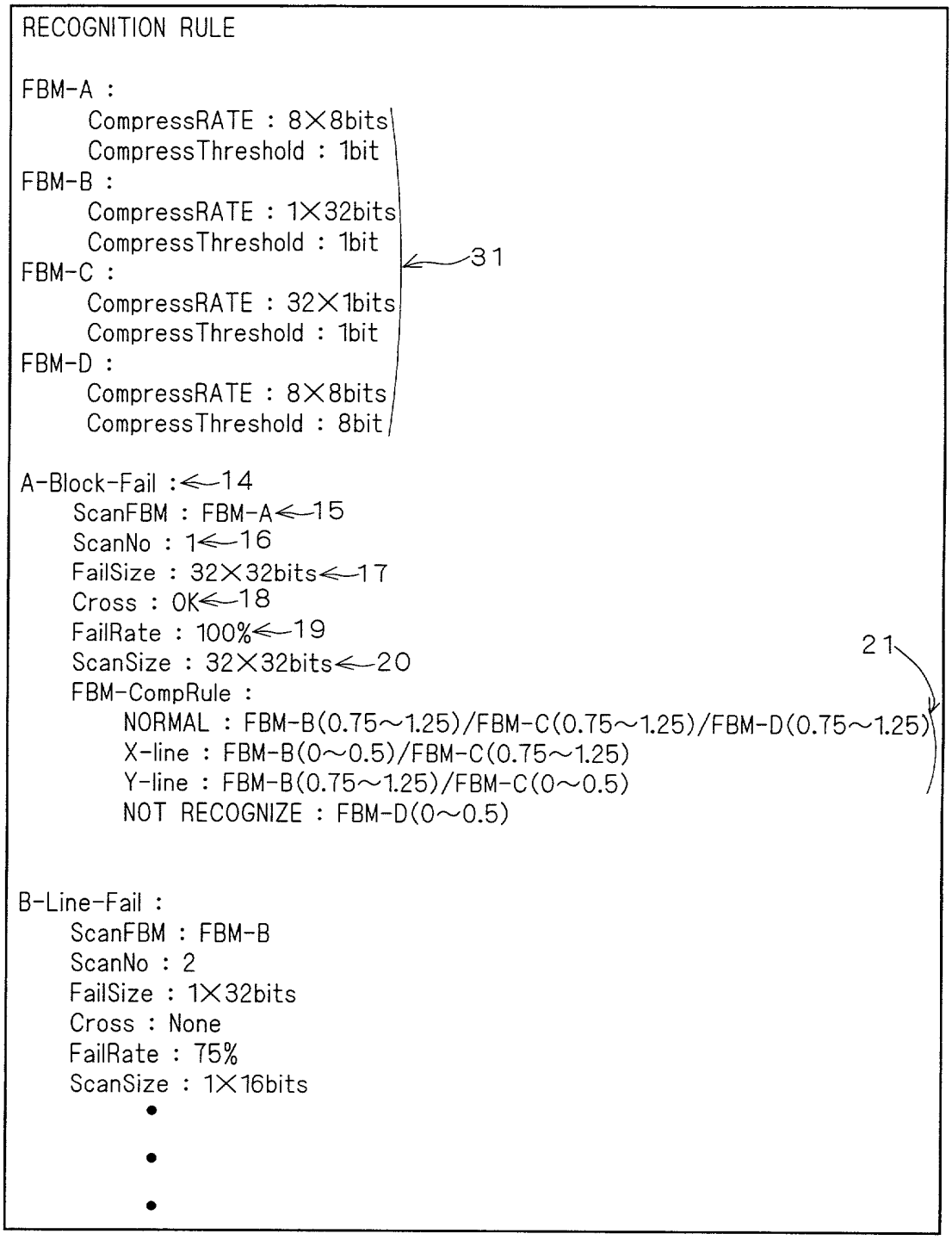

RECOGNITION RULE
FBM-A :
CompressRATE : 8×8bits
CompressThreshold : 1bit
FBM-B :
CompressRATE : 1×32bits
CompressThreshold : 1bit
FBM-C :
CompressRATE : 32×1bits
CompressThreshold : 1bit
FBM-D :
CompressRATE : 8×8bits
CompressThreshold : 8bit
31
A-Block-Fail :
14
ScanFBM : FBM-A
15
ScanNo : 1
16
FailSize : 32×32bits
17
Cross : OK
18
FailRate : 100%
19
ScanSize : 32×32bits
20
FBM-CompRule :
NORMAL : FBM-B(0.75~1.25)/FBM-C(0.75~1.25)/FBM-D(0.75~1.25)
X-line : FBM-B(0~0.5)/FBM-C(0.75~1.25)
Y-line : FBM-B(0.75~1.25)/FBM-C(0~0.5)
NOT RECOGNIZE : FBM-D(0~0.5)
21
B-Line-Fail :
ScanFBM : FBM-B
ScanNo : 2
FailSize : 1×32bits
Cross : None
FailRate : 75%
ScanSize : 1×16bits

FIG. 15A

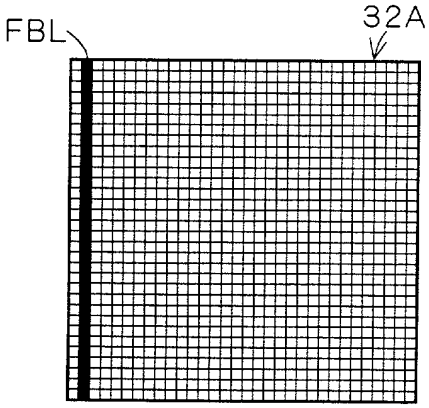


FIG. 15A

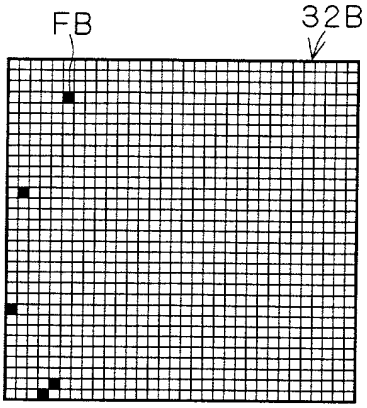


FIG. 16

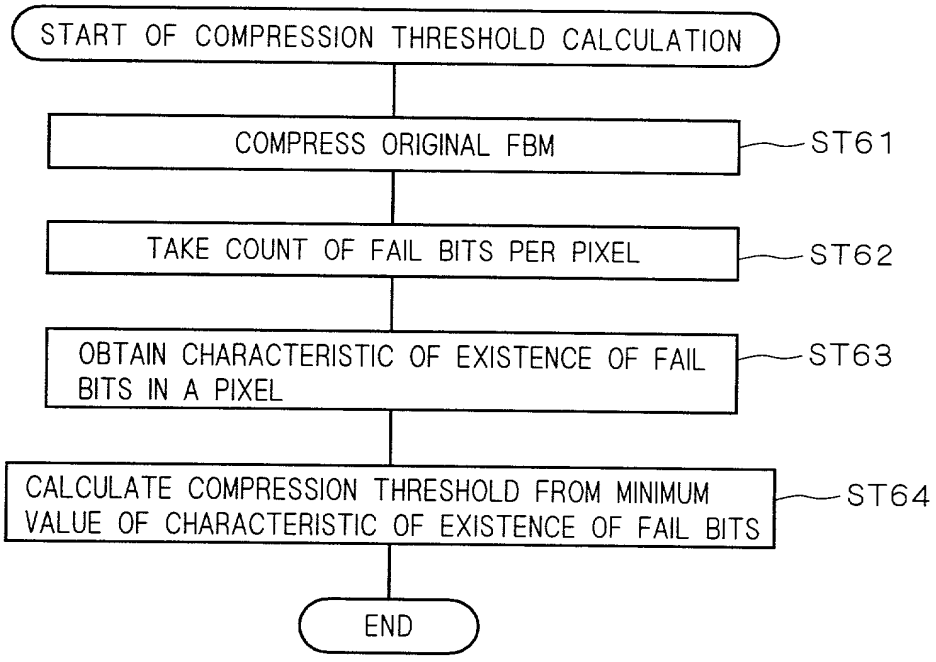


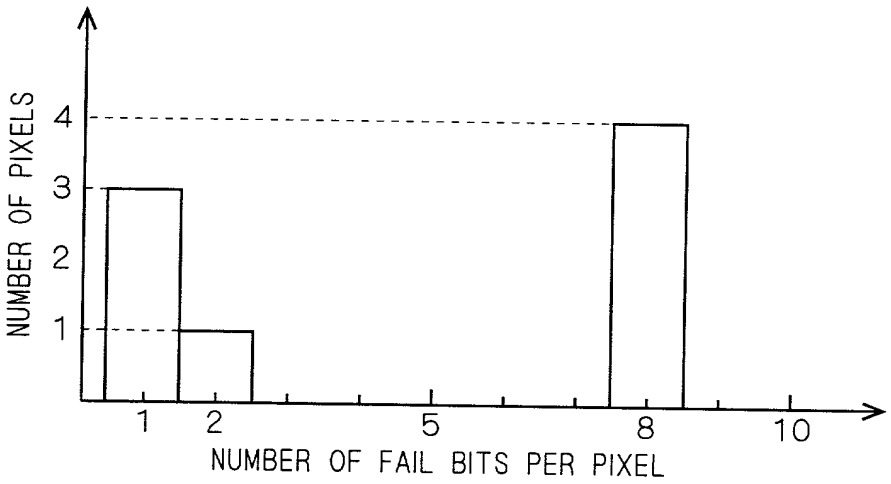
FIG. 17A

8	0	0	0
8	0	0	0
8	0	0	0
8	0	0	0

FIG. 17B

1	0	0	0
1	0	0	0
1	0	0	0
2	0	0	0

FIG. 18



US2005289418A1

FIG. 19

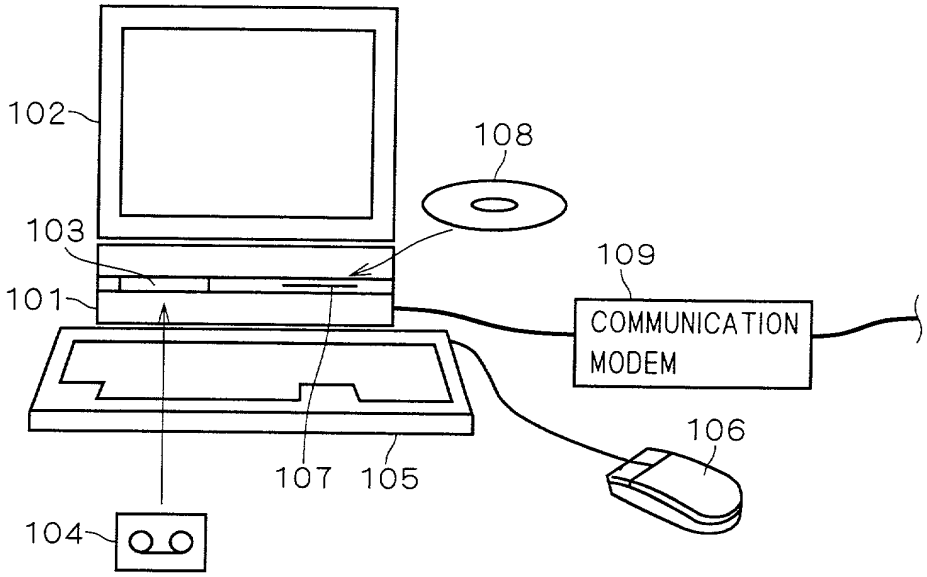

102
108
103
109
101
COMMUNICATION
MODEM
106
107
105
104

FIG. 20

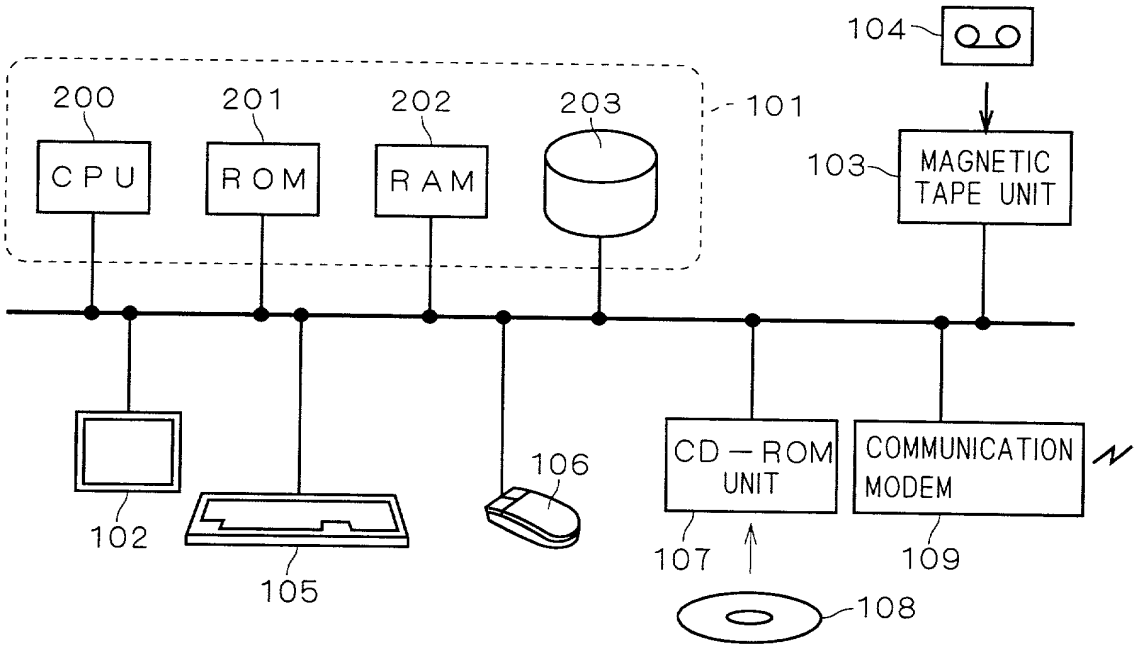

104
200
201
202
203
101
CPU
ROM
RAM
103
MAGNETIC
TAPE UNIT
102
105
106
CD – ROM
UNIT
COMMUNICATION
MODEM
107
109
108

FIG. 21

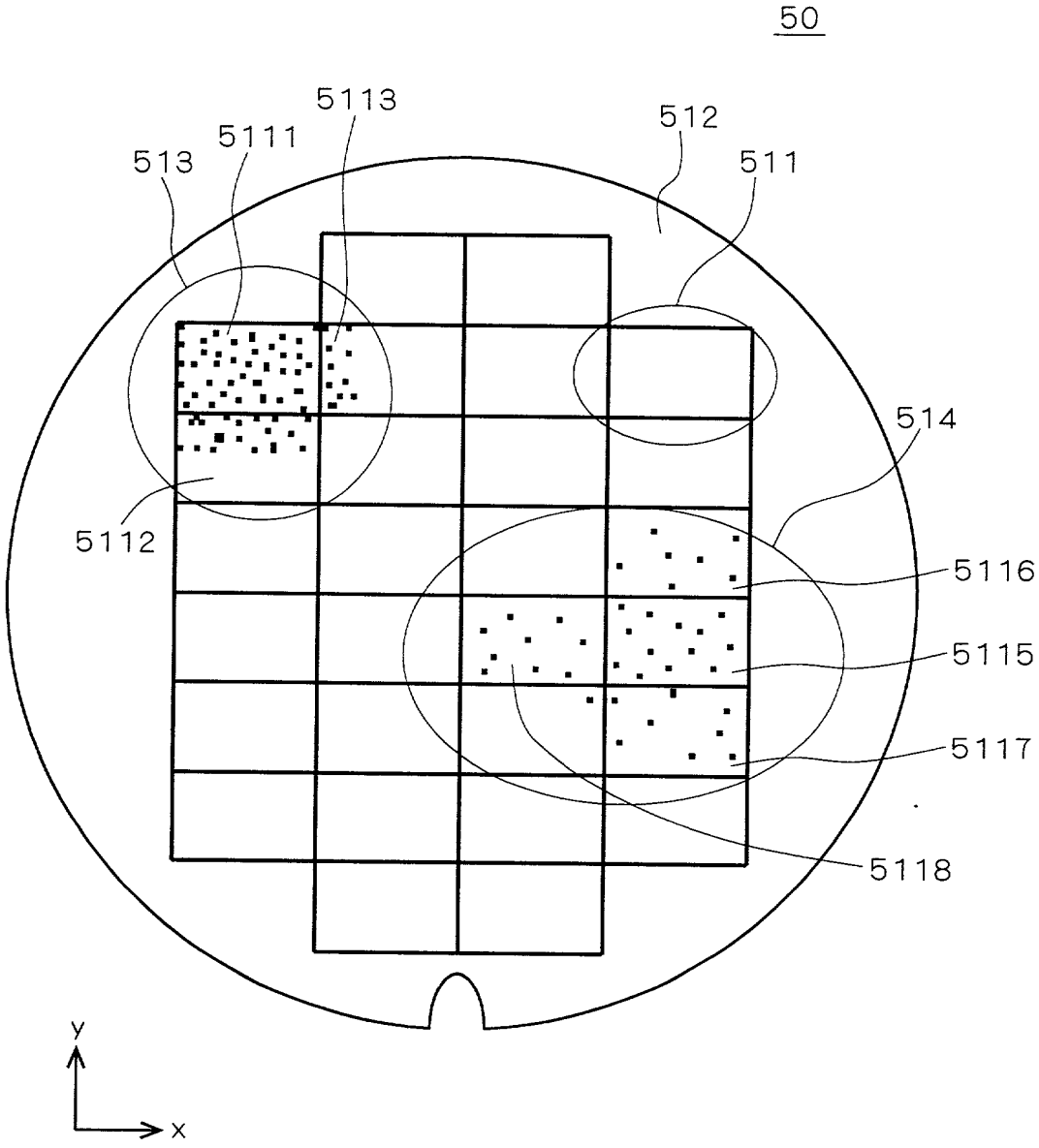


FIG. 22

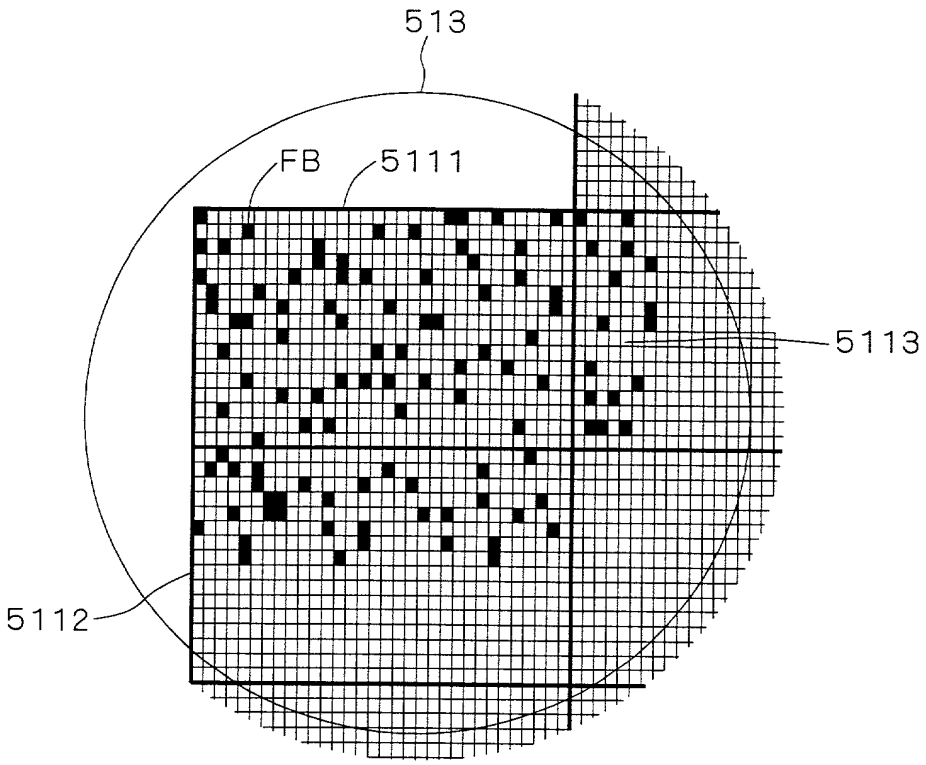


FIG. 23

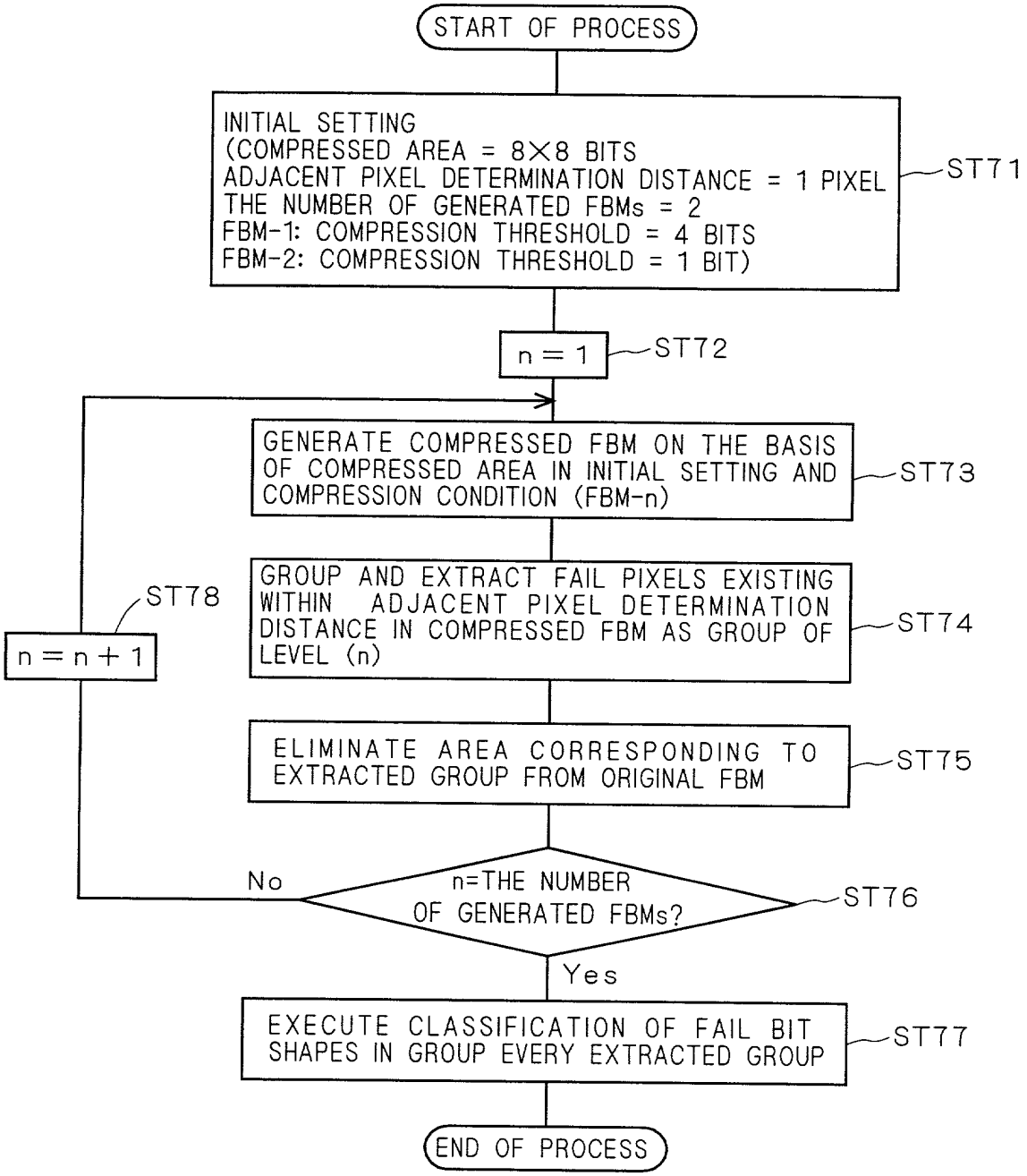

START OF PROCESS
INITIAL SETTING
(COMPRESSED AREA = 8×8 BITS
ADJACENT PIXEL DETERMINATION DISTANCE = 1 PIXEL
THE NUMBER OF GENERATED FBMs = 2
FBM-1: COMPRESSION THRESHOLD = 4 BITS
FBM-2: COMPRESSION THRESHOLD = 1 BIT)
ST71
n = 1
ST72
GENERATE COMPRESSED FBM ON THE BASIS OF COMPRESSED AREA IN INITIAL SETTING AND COMPRESSION CONDITION (FBM-n)
ST73
GROUP AND EXTRACT FAIL PIXELS EXISTING WITHIN ADJACENT PIXEL DETERMINATION DISTANCE IN COMPRESSED FBM AS GROUP OF LEVEL (n)
ST74
ELIMINATE AREA CORRESPONDING TO EXTRACTED GROUP FROM ORIGINAL FBM
ST75
n=THE NUMBER OF GENERATED FBMs?
ST76
No
n = n + 1
ST78
Yes
EXECUTE CLASSIFICATION OF FAIL BIT SHAPES IN GROUP EVERY EXTRACTED GROUP
ST77
END OF PROCESS

FIG. 24

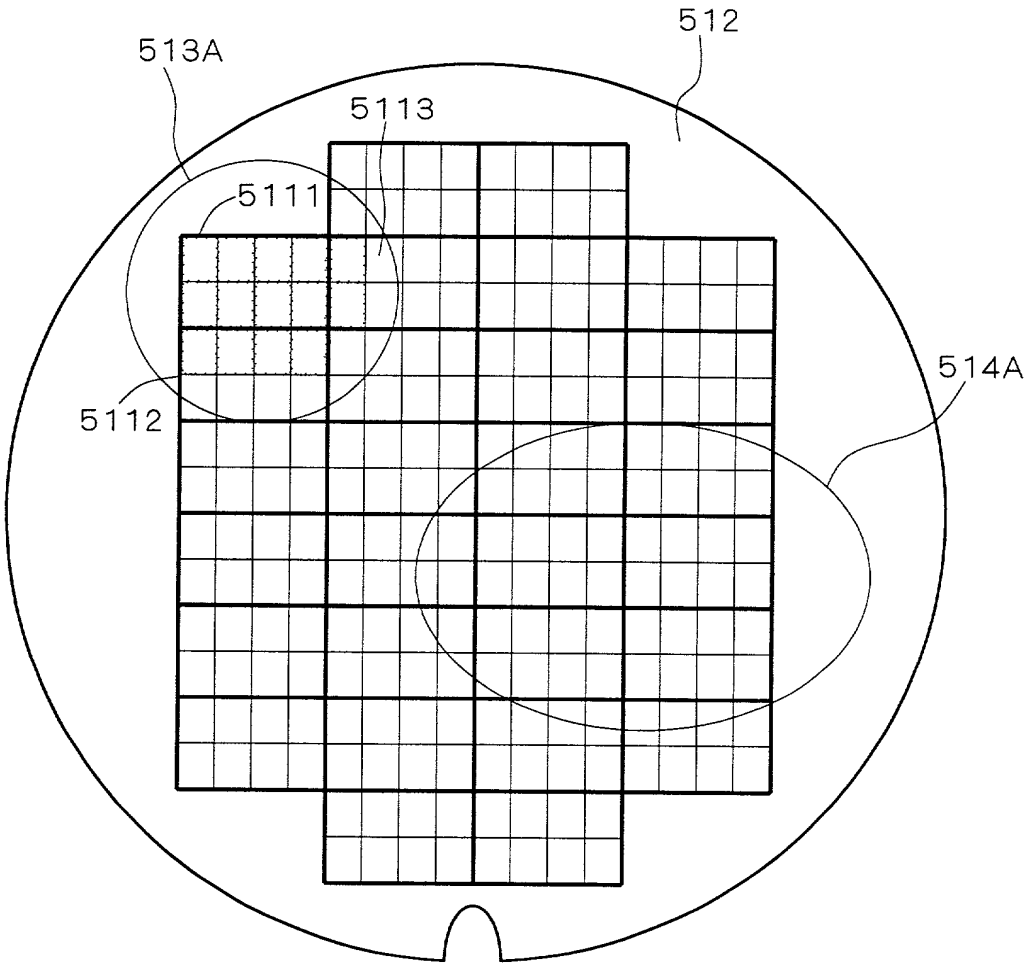
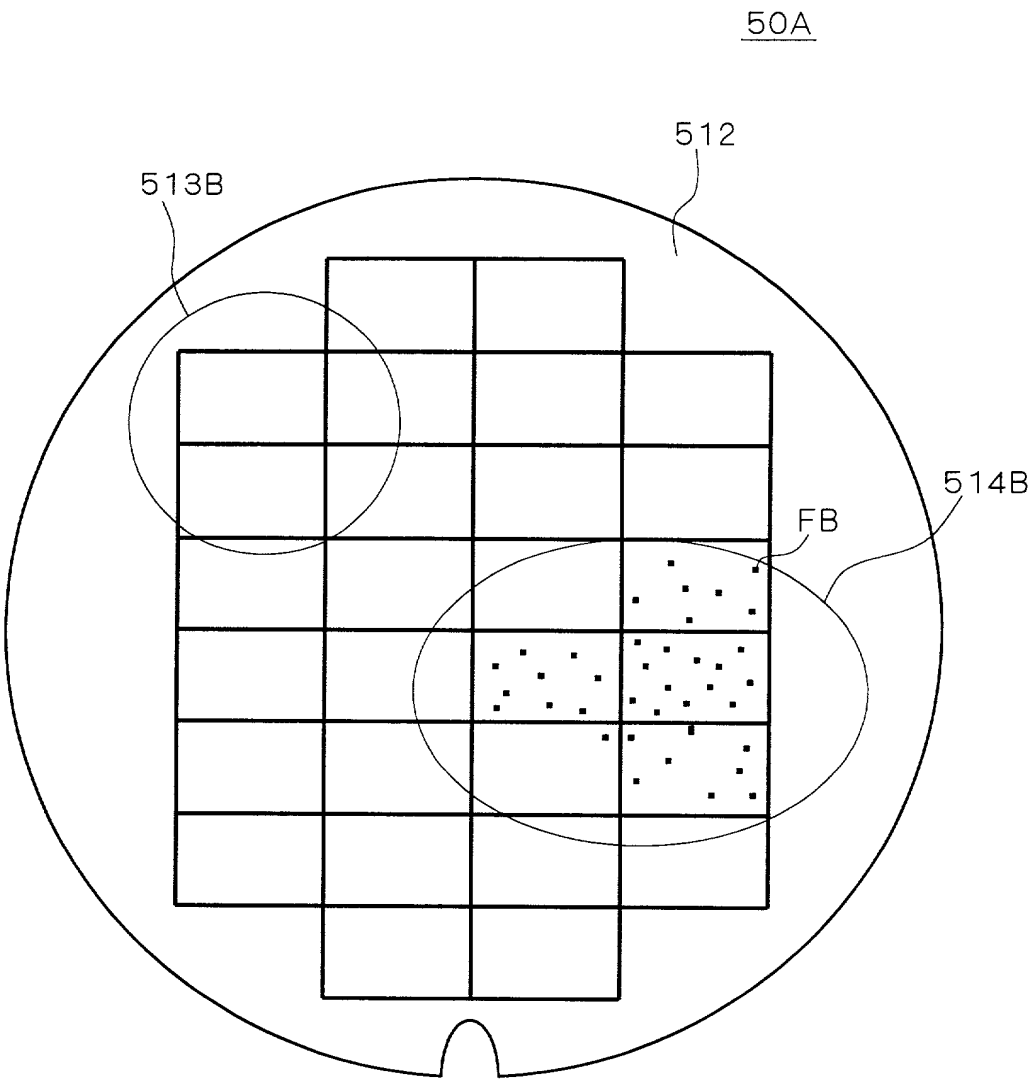


FIG. 25



US 2003-0202703 A1

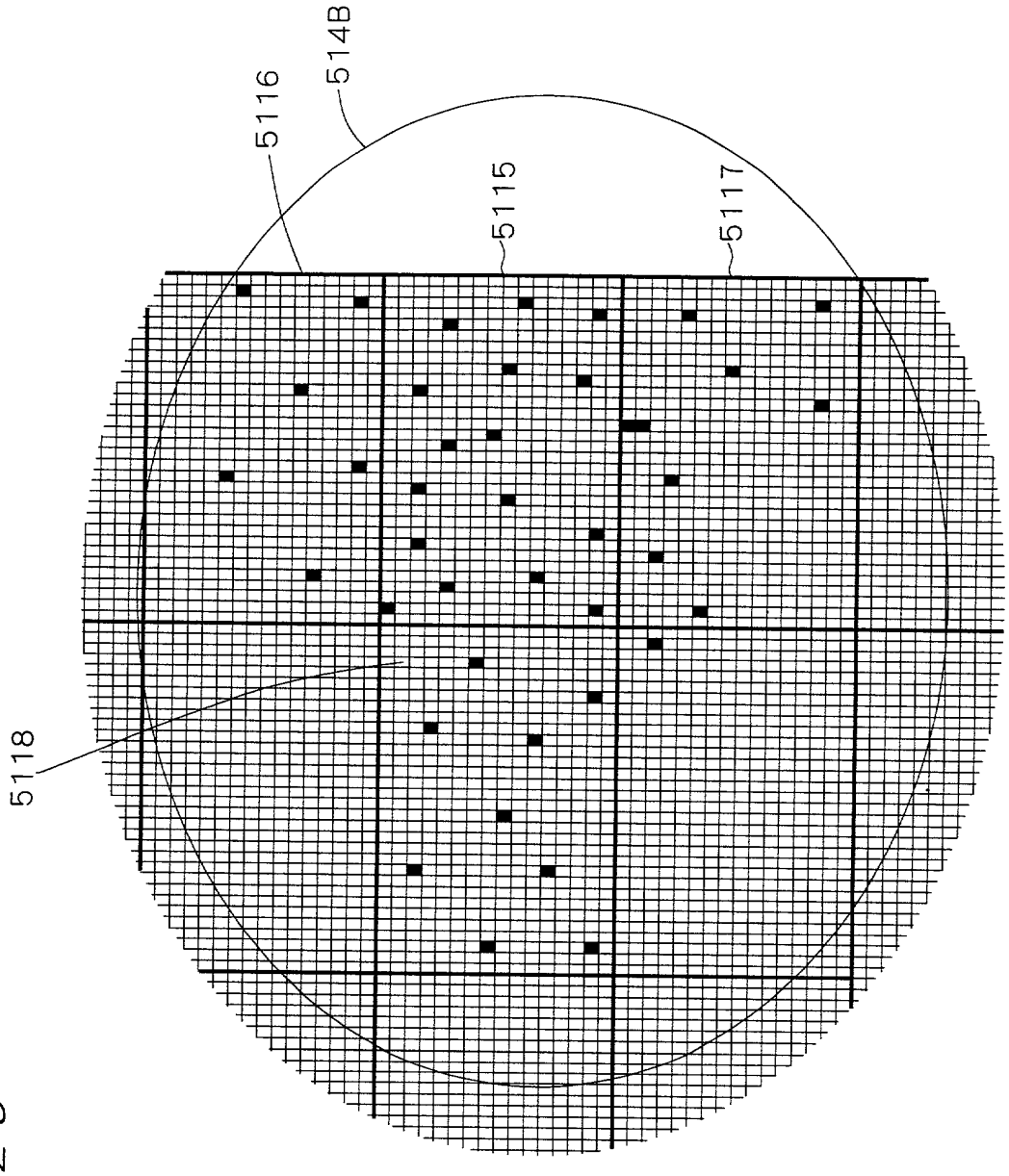


FIG. 26

FIG. 27

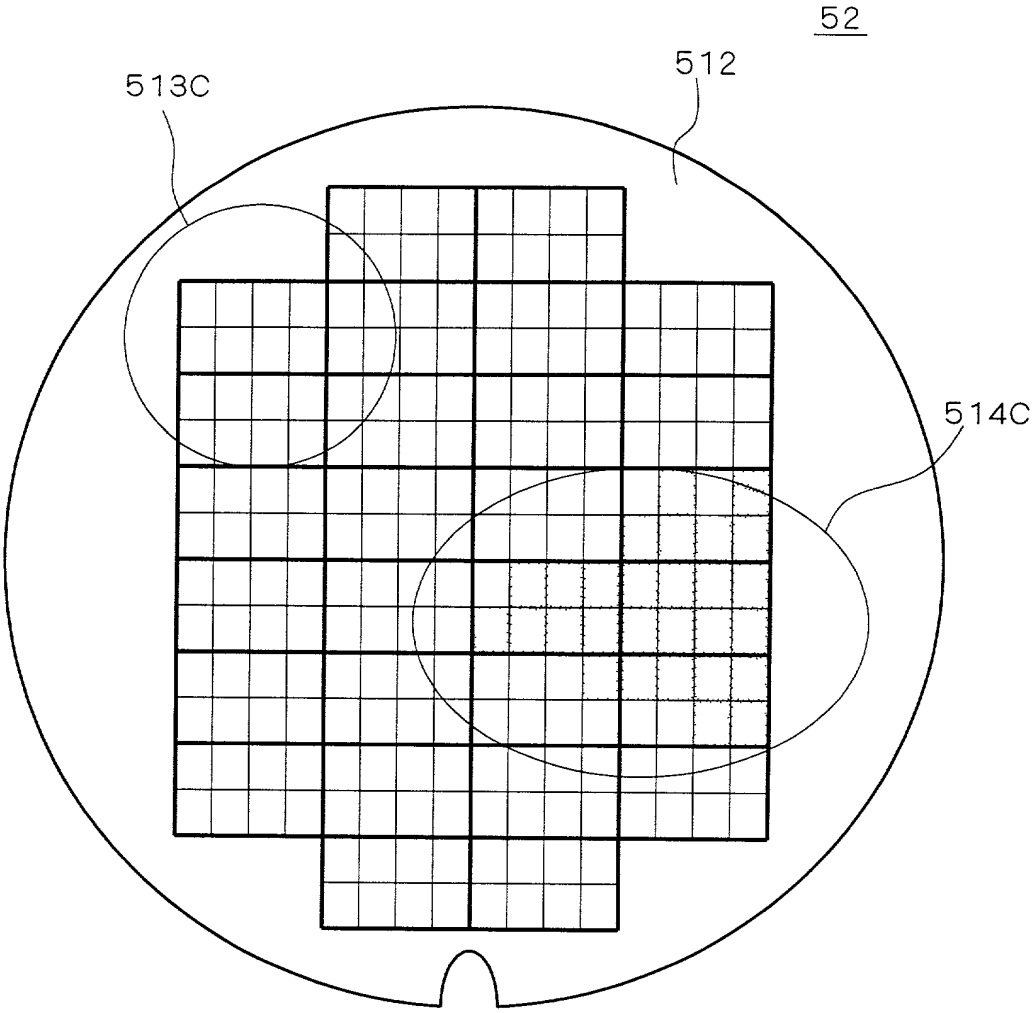


FIG. 28

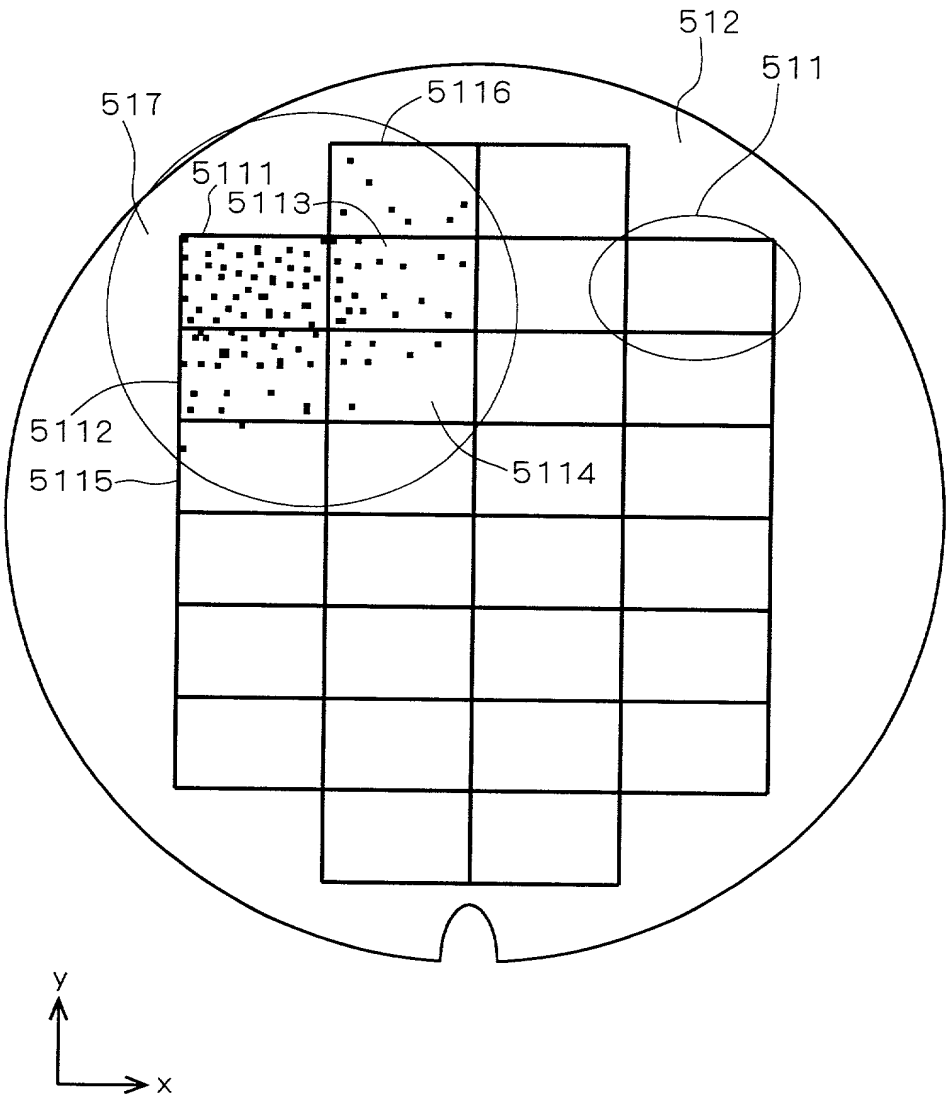


FIG. 29

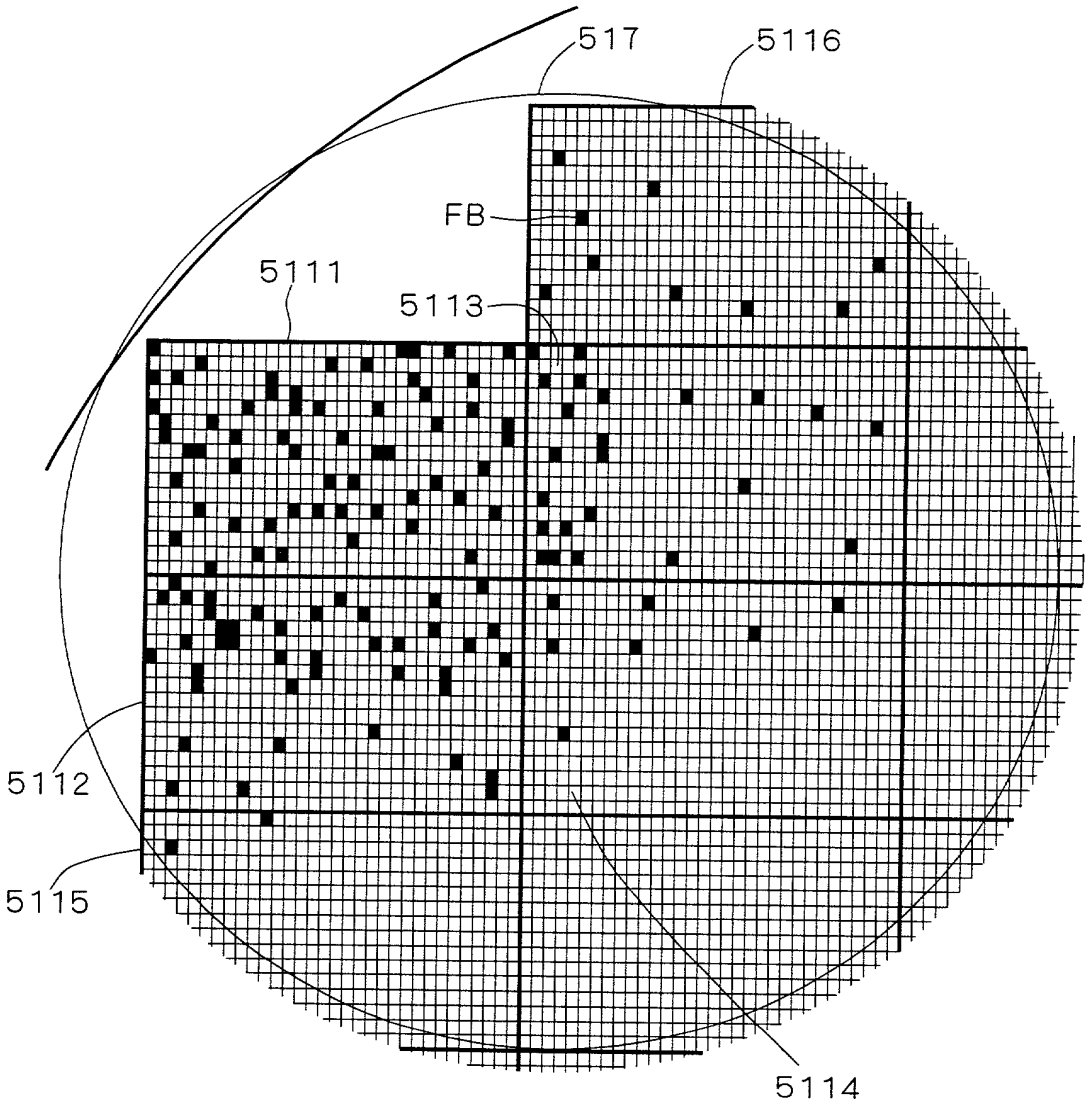
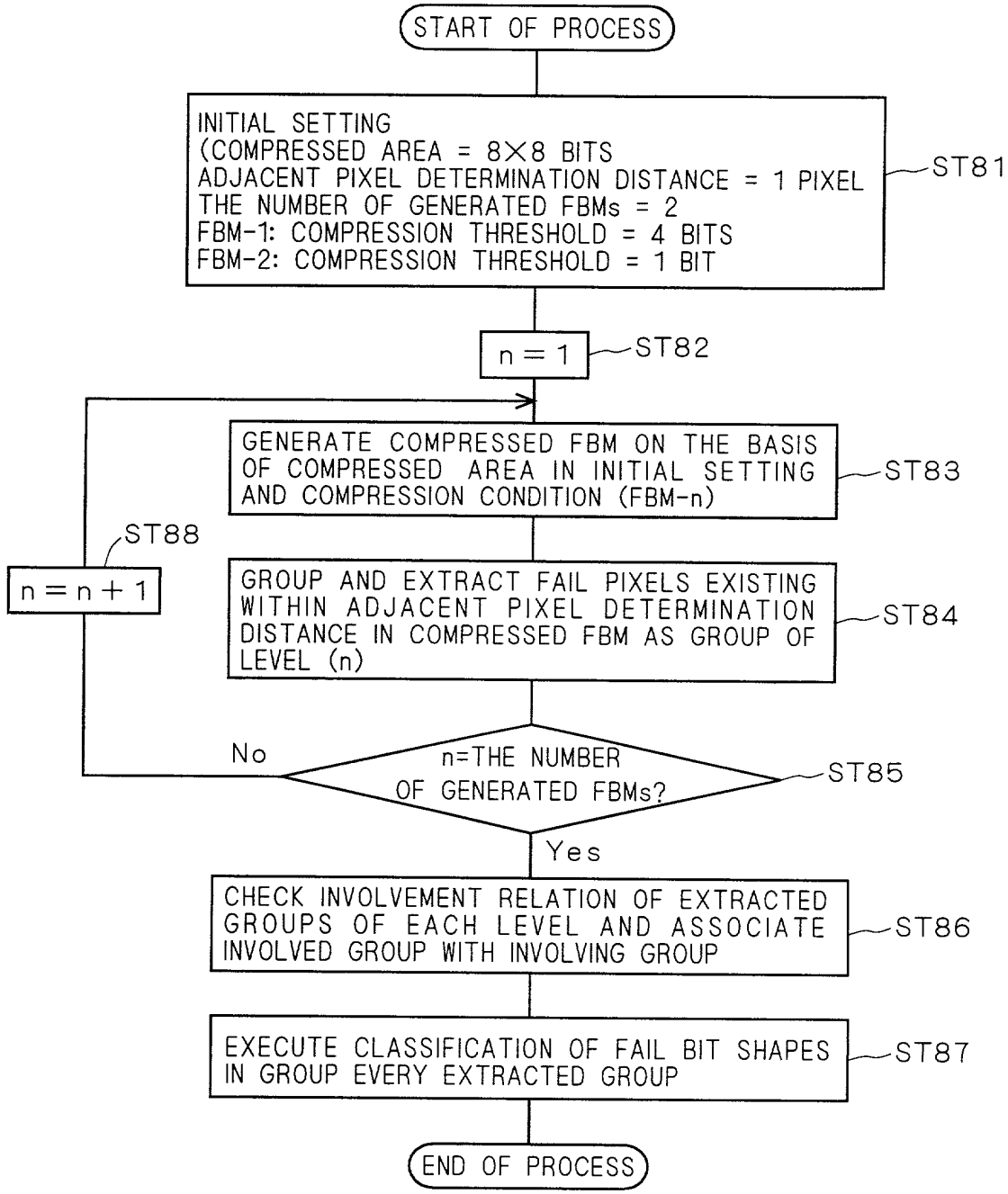


FIG. 30



US 2008/0294960 A1

FIG. 31

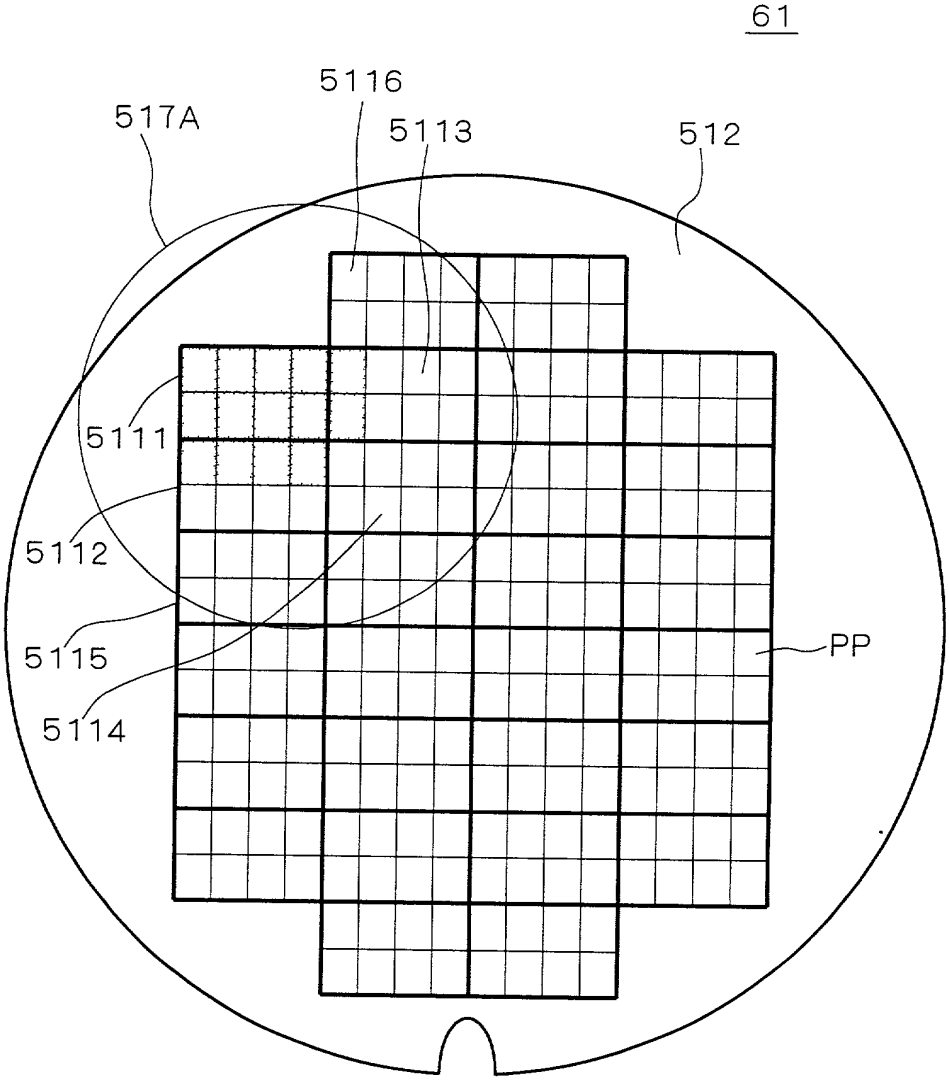


FIG. 32

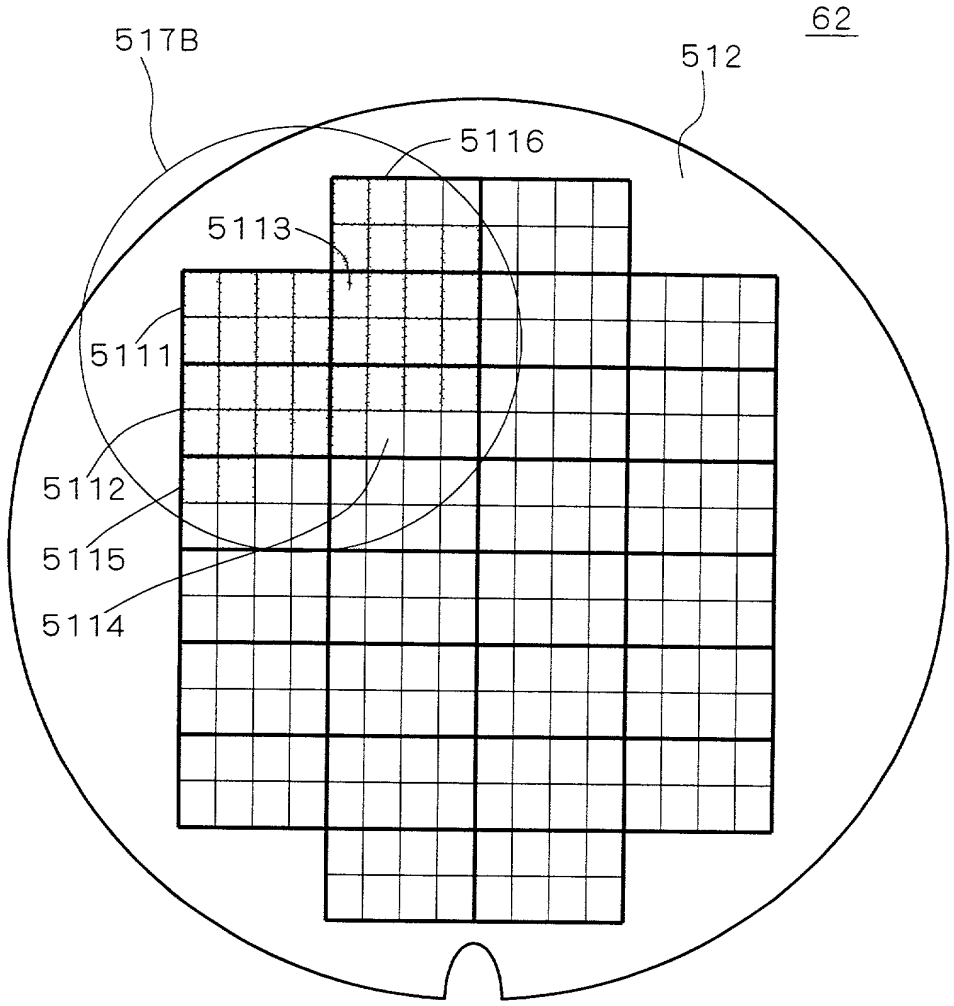

62
517B
512
5116
5113
5111
5112
5115
5114

FIG. 33

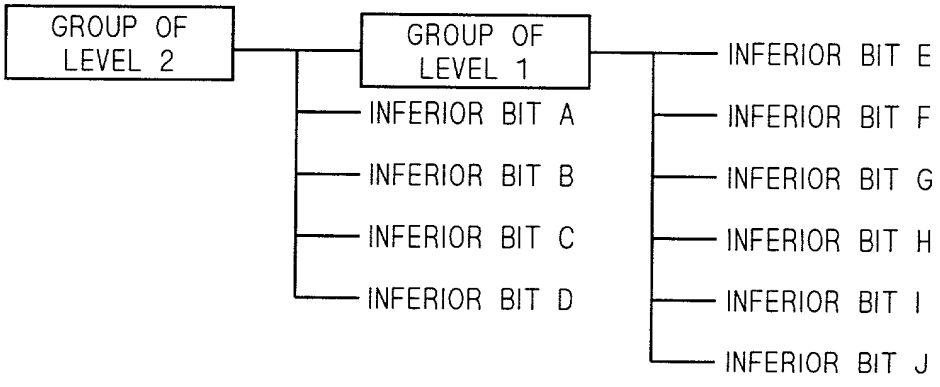

GROUP OF LEVEL 2
GROUP OF LEVEL 1
INFERIOR BIT A
INFERIOR BIT B
INFERIOR BIT C
INFERIOR BIT D
INFERIOR BIT E
INFERIOR BIT F
INFERIOR BIT G
INFERIOR BIT H
INFERIOR BIT I
INFERIOR BIT J

FIG. 34

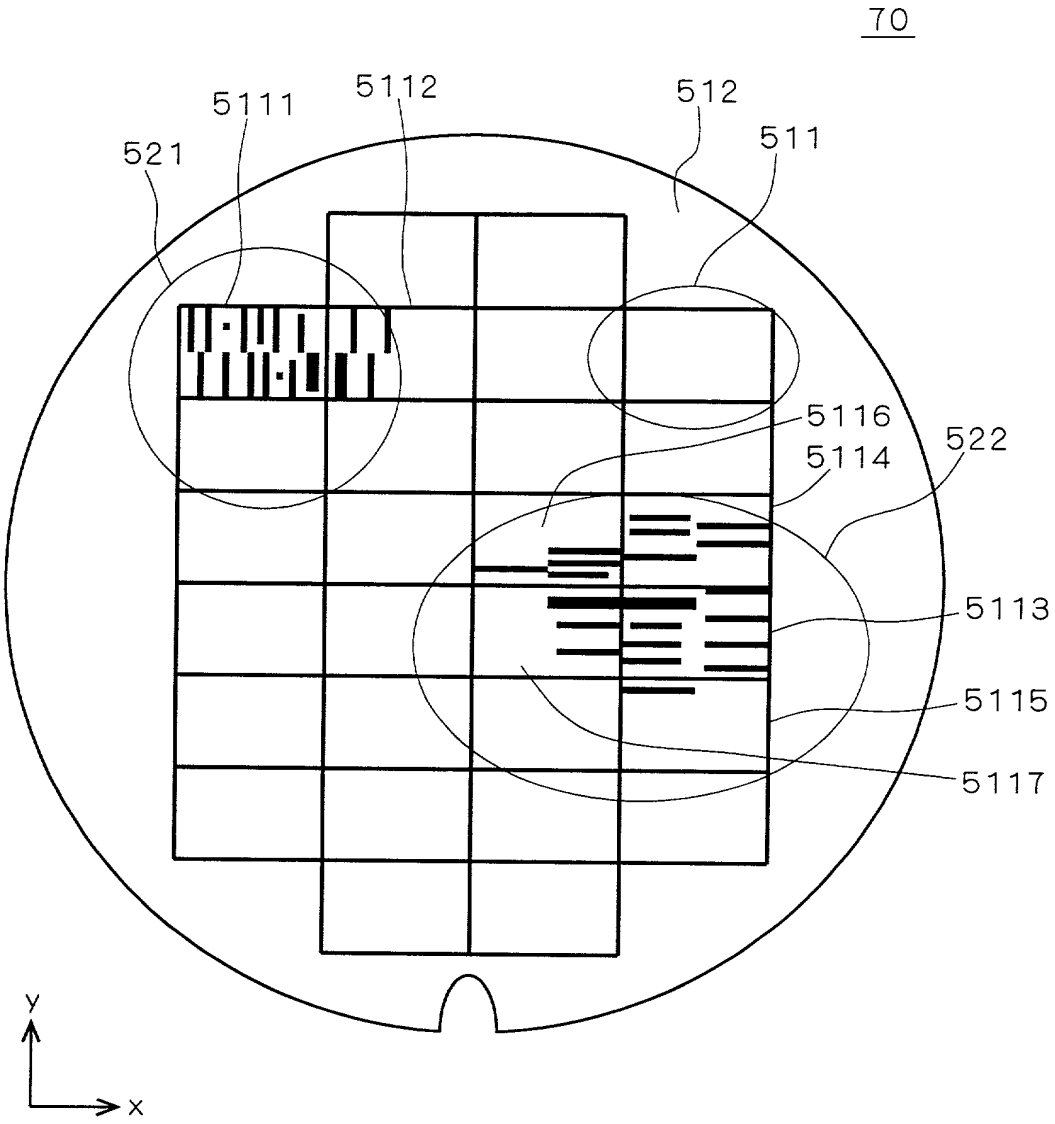


FIG. 35

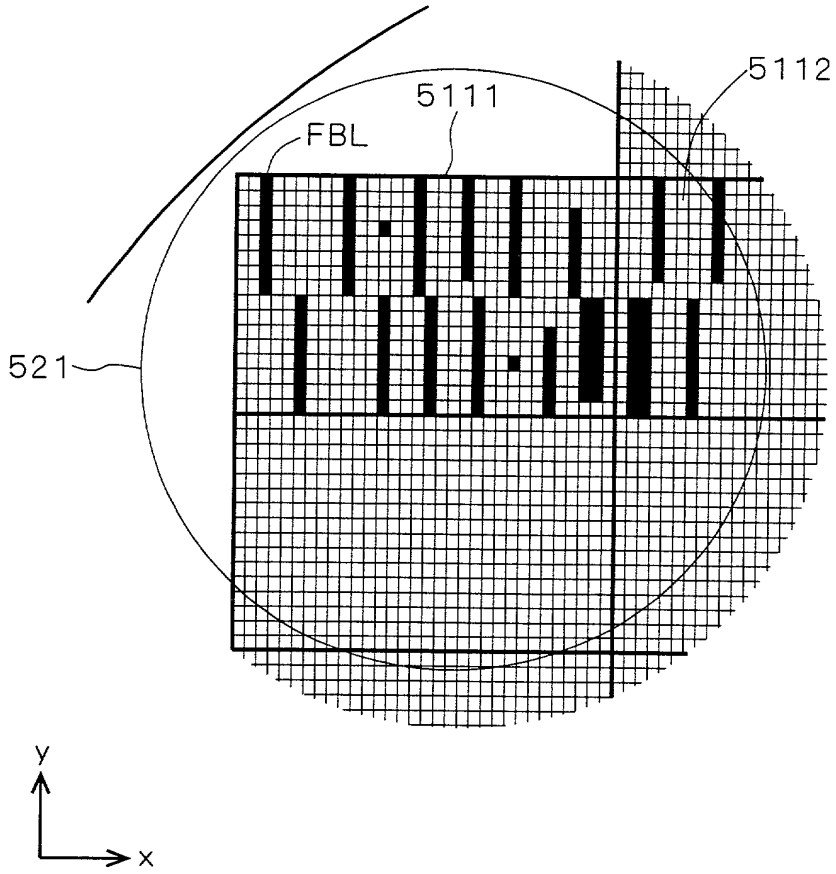


FIG. 36

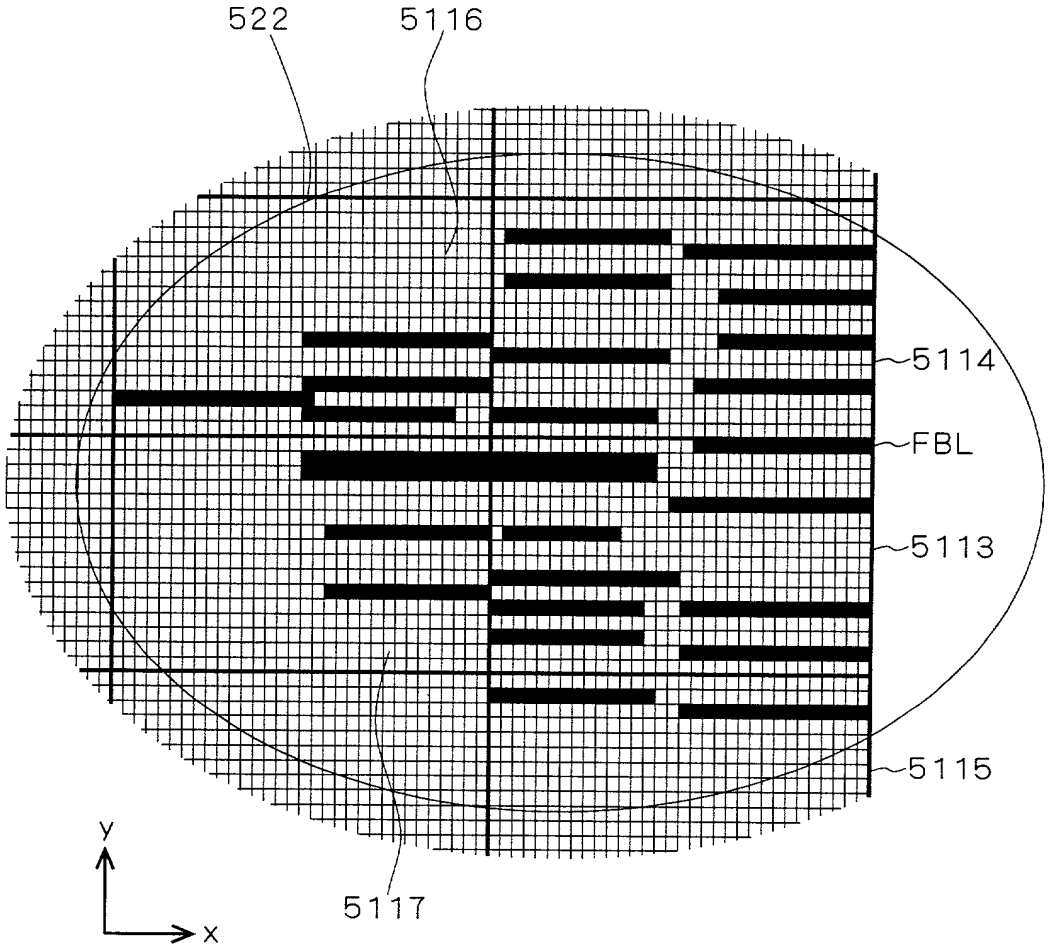


FIG. 37

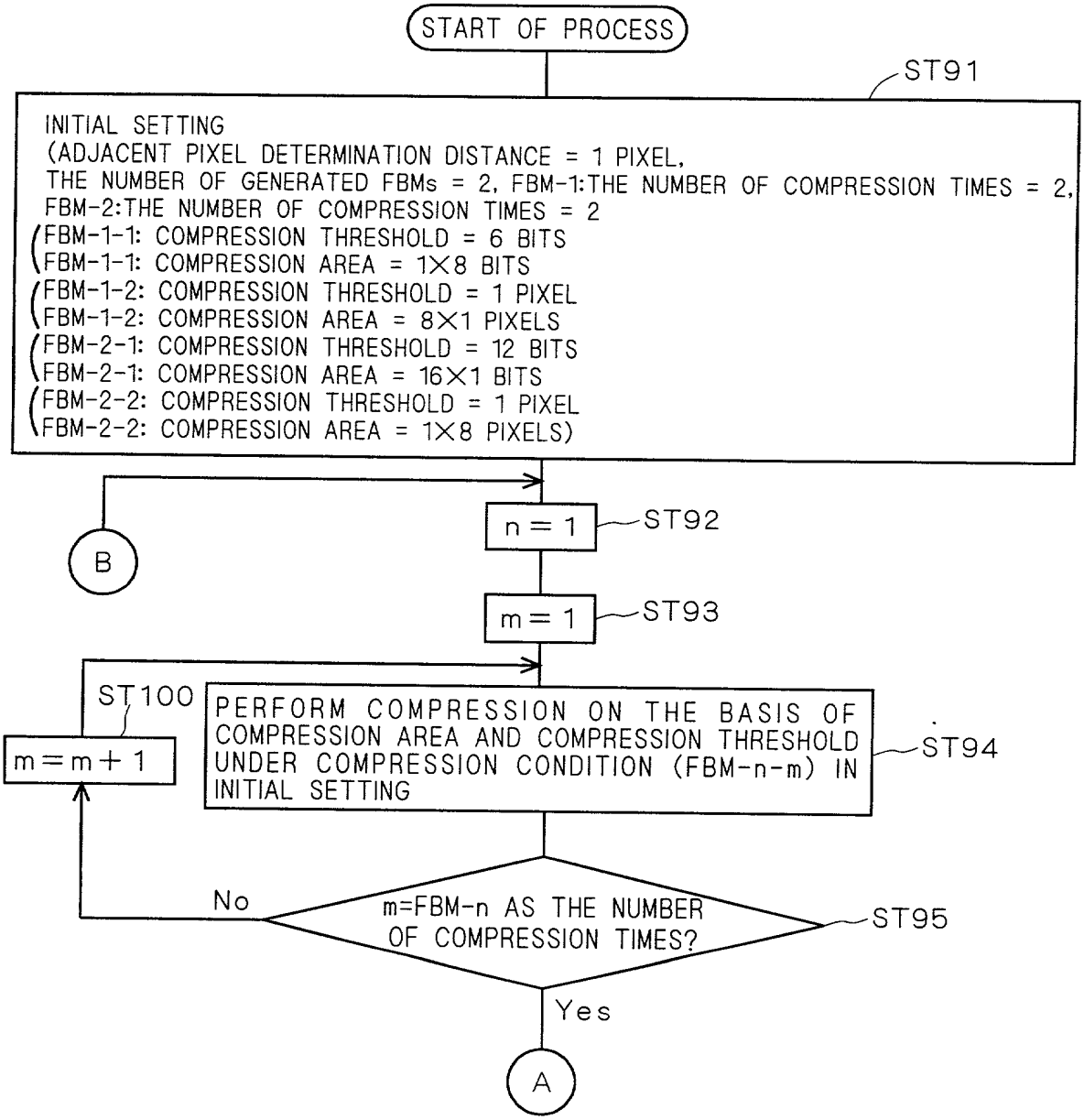
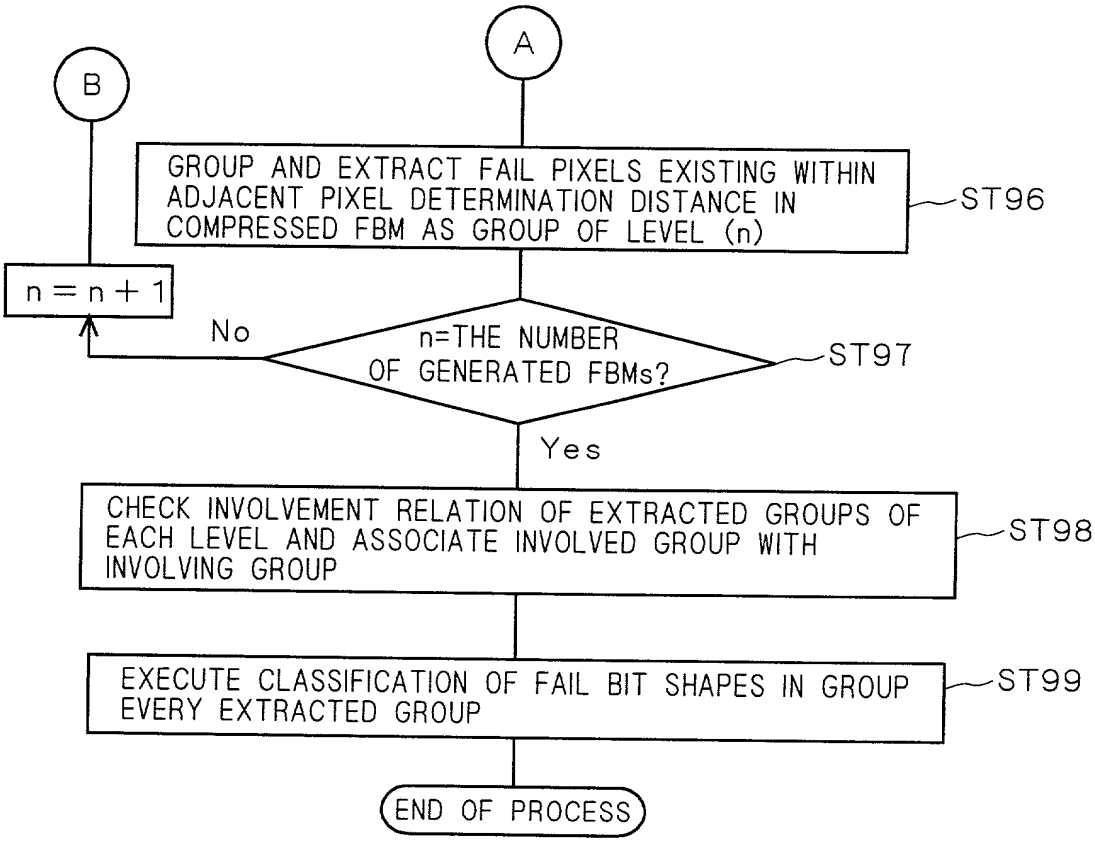

START OF PROCESS
ST91
INITIAL SETTING
(ADJACENT PIXEL DETERMINATION DISTANCE = 1 PIXEL,
THE NUMBER OF GENERATED FBMs = 2, FBM-1:THE NUMBER OF COMPRESSION TIMES = 2,
FBM-2:THE NUMBER OF COMPRESSION TIMES = 2
FBM-1-1: COMPRESSION THRESHOLD = 6 BITS
FBM-1-1: COMPRESSION AREA = 1×8 BITS
FBM-1-2: COMPRESSION THRESHOLD = 1 PIXEL
FBM-1-2: COMPRESSION AREA = 8×1 PIXELS
FBM-2-1: COMPRESSION THRESHOLD = 12 BITS
FBM-2-1: COMPRESSION AREA = 16×1 BITS
FBM-2-2: COMPRESSION THRESHOLD = 1 PIXEL
FBM-2-2: COMPRESSION AREA = 1×8 PIXELS)
B
n = 1
ST92
m = 1
ST93
ST100
m = m + 1
PERFORM COMPRESSION ON THE BASIS OF COMPRESSION AREA AND COMPRESSION THRESHOLD UNDER COMPRESSION CONDITION (FBM-n-m) IN INITIAL SETTING
ST94
No
m=FBM-n AS THE NUMBER OF COMPRESSION TIMES?
ST95
Yes
A

FIG. 38



US2005204209A1

FIG. 39

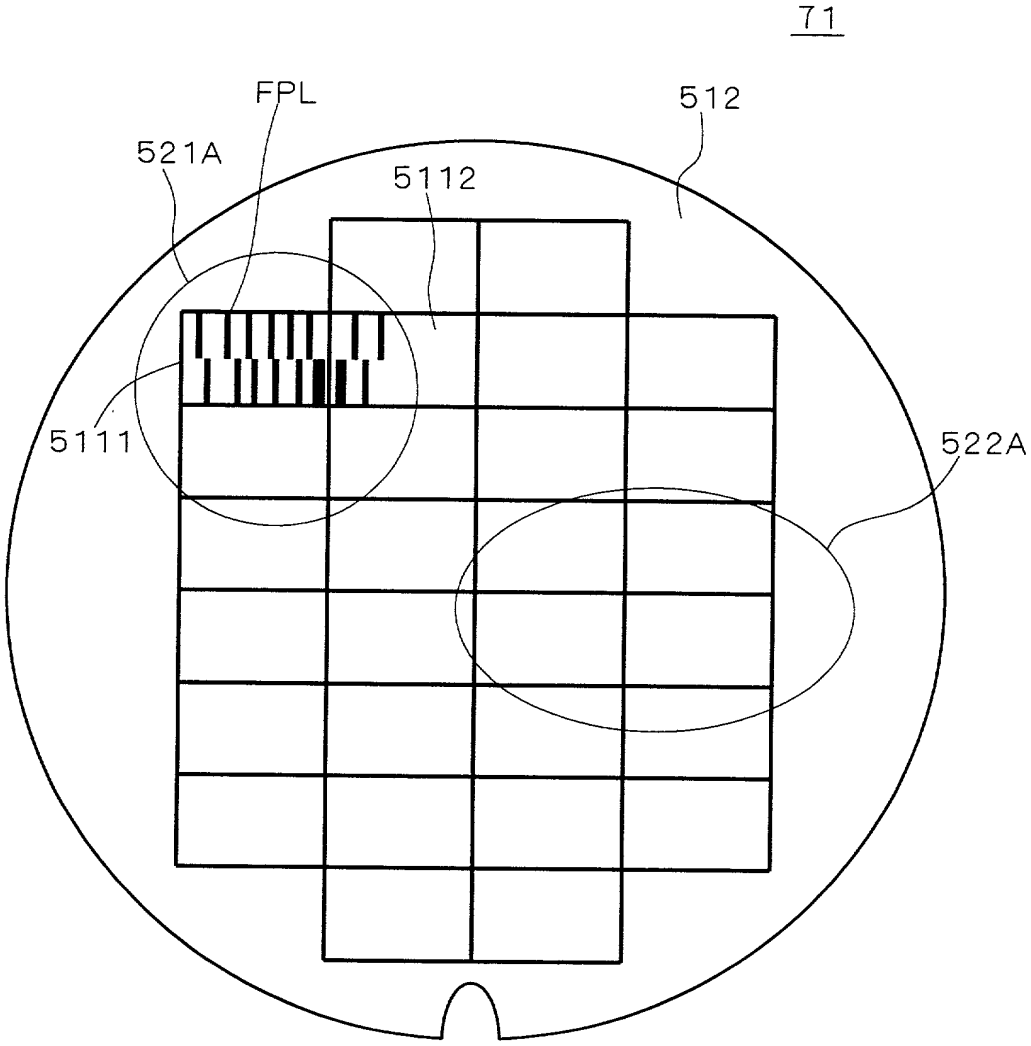


FIG. 40

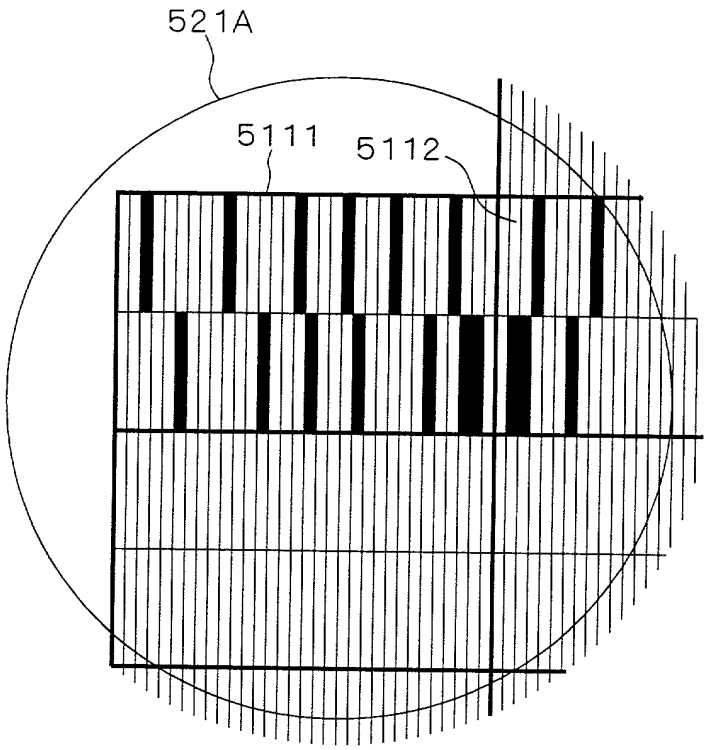


FIG. 41

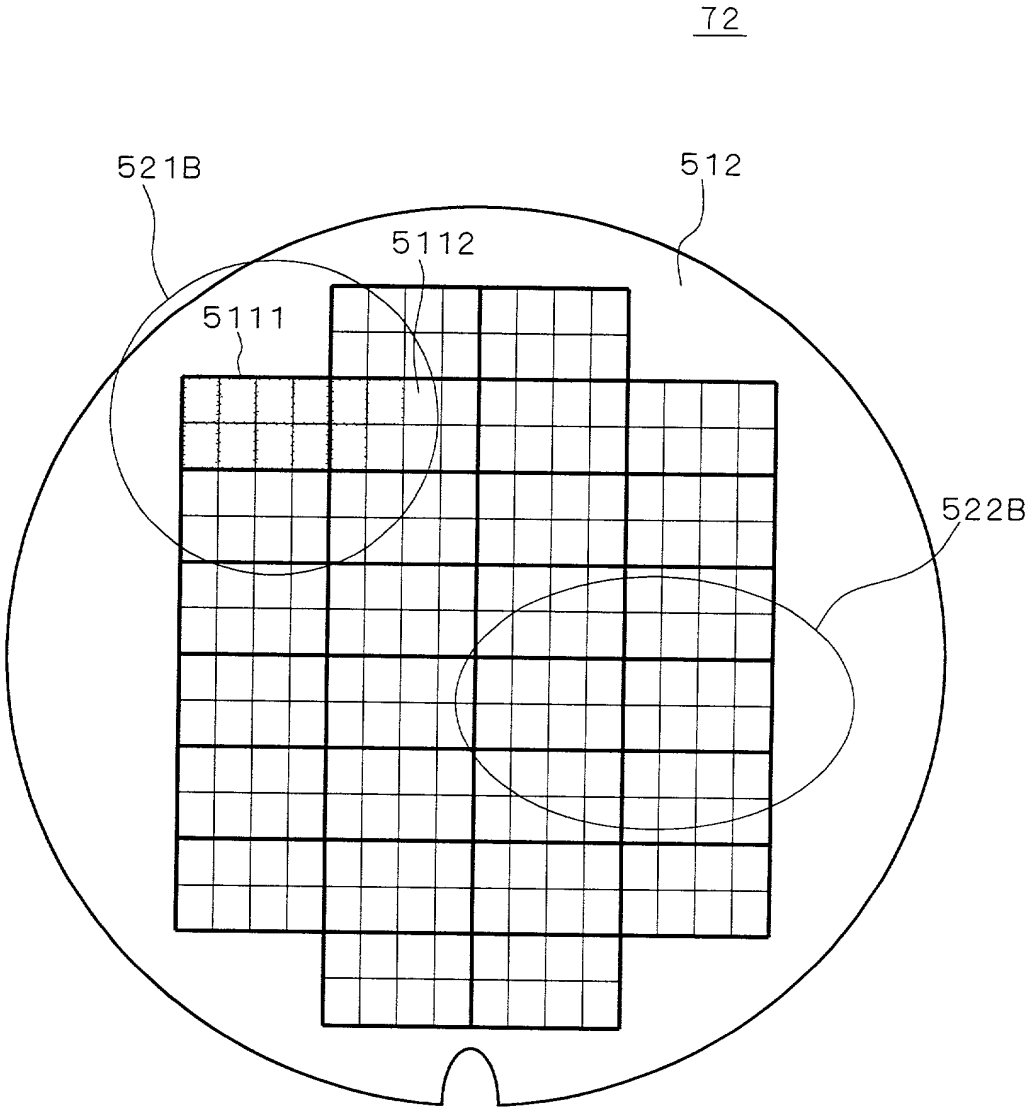


FIG. 42

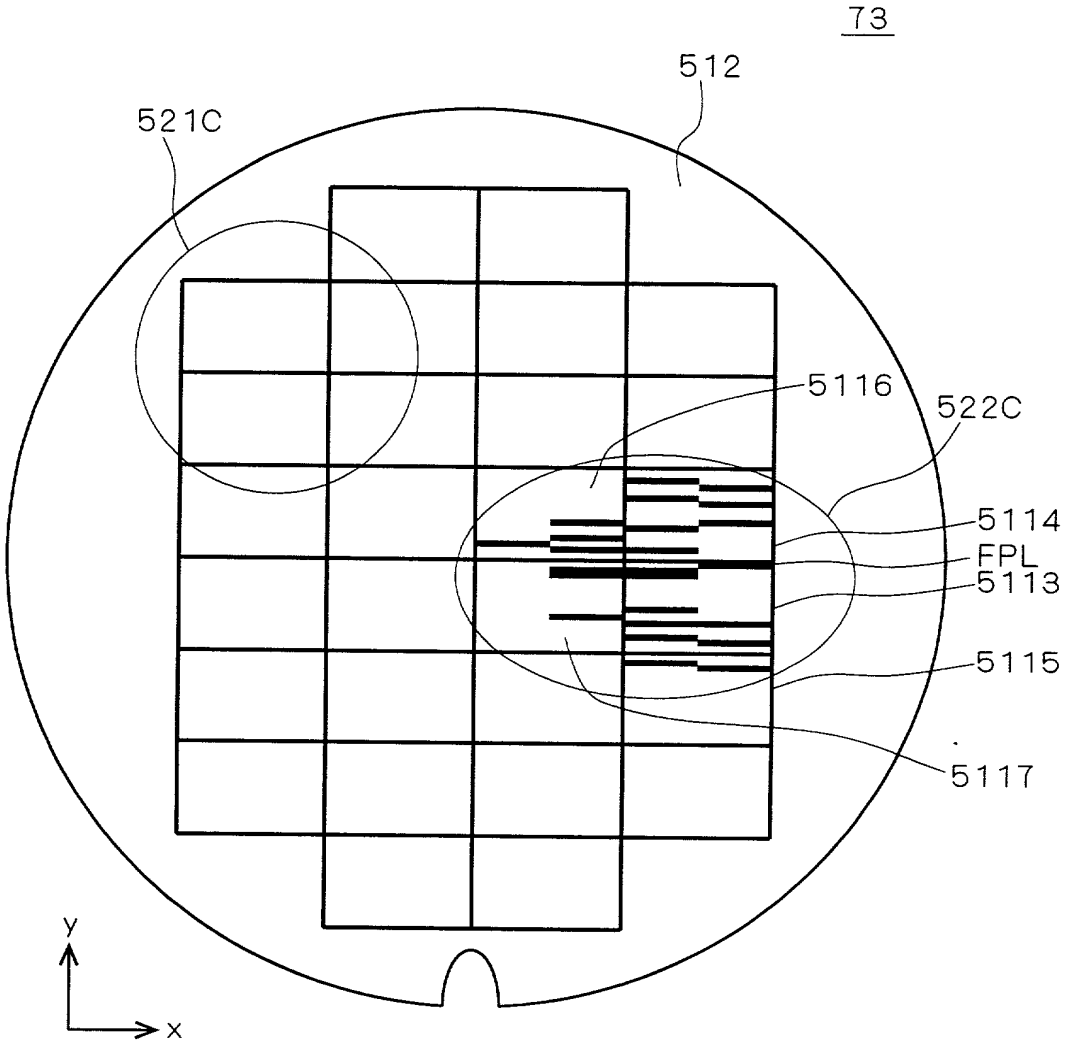


FIG. 43

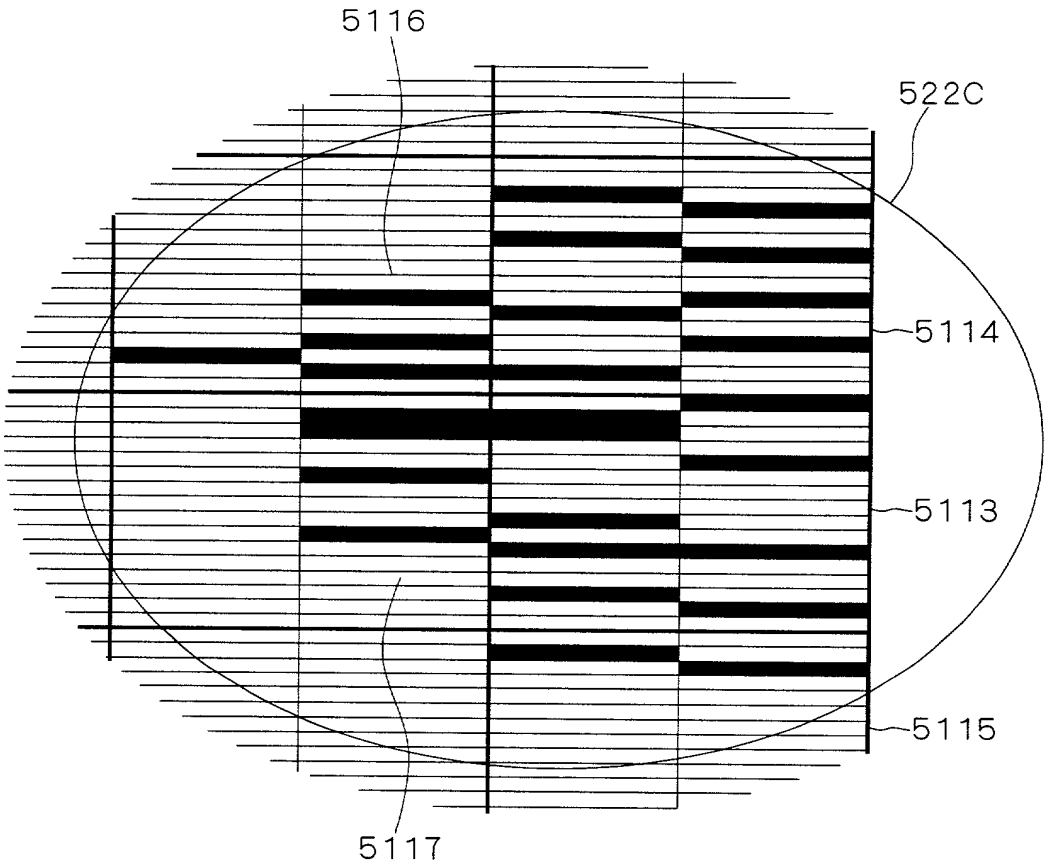


FIG. 44

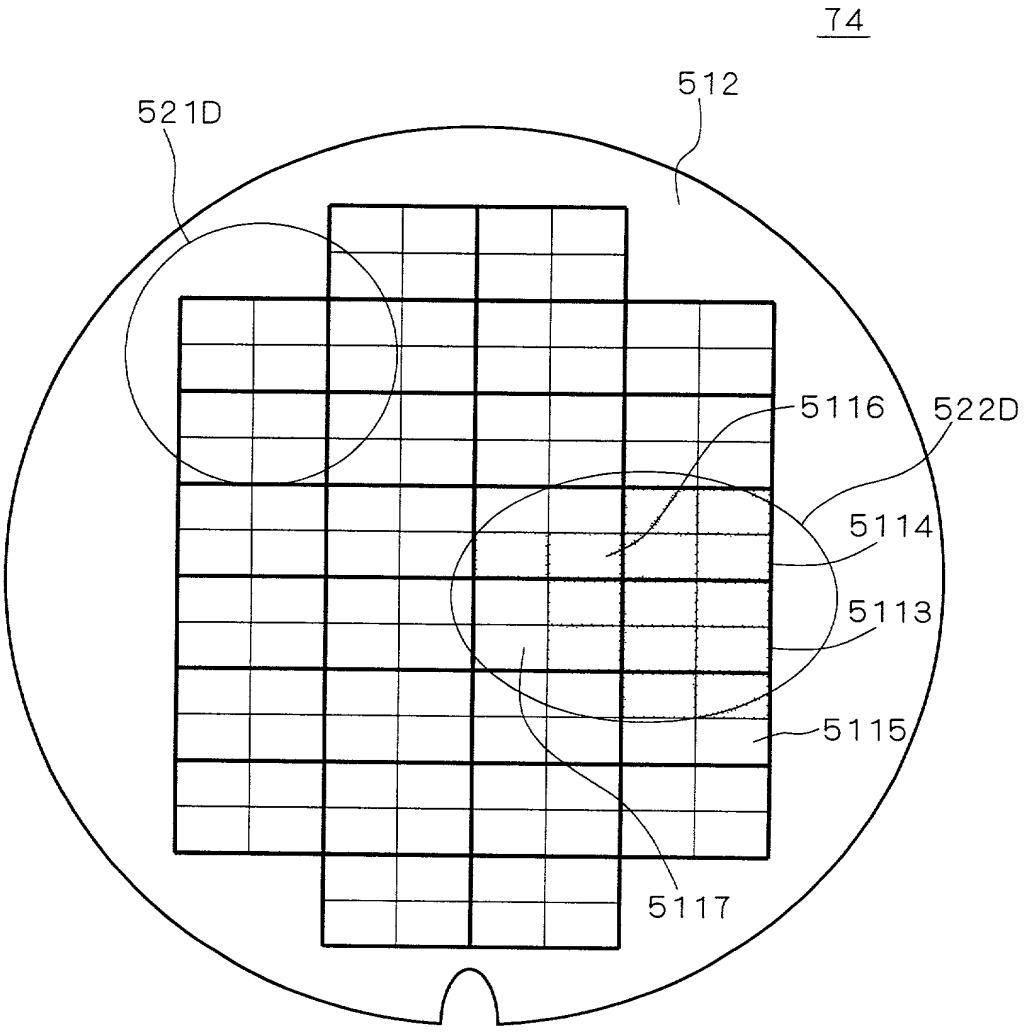


FIG. 45

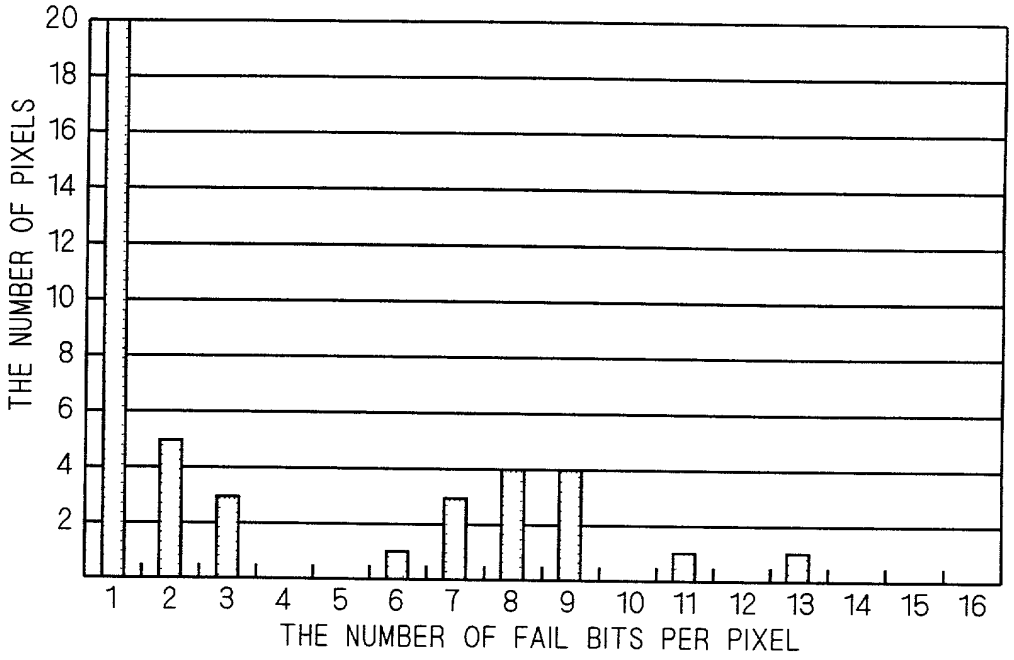

THE NUMBER OF PIXELS
20
18
16
14
12
10
8
6
4
2
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
THE NUMBER OF FAIL BITS PER PIXEL

FIG. 46

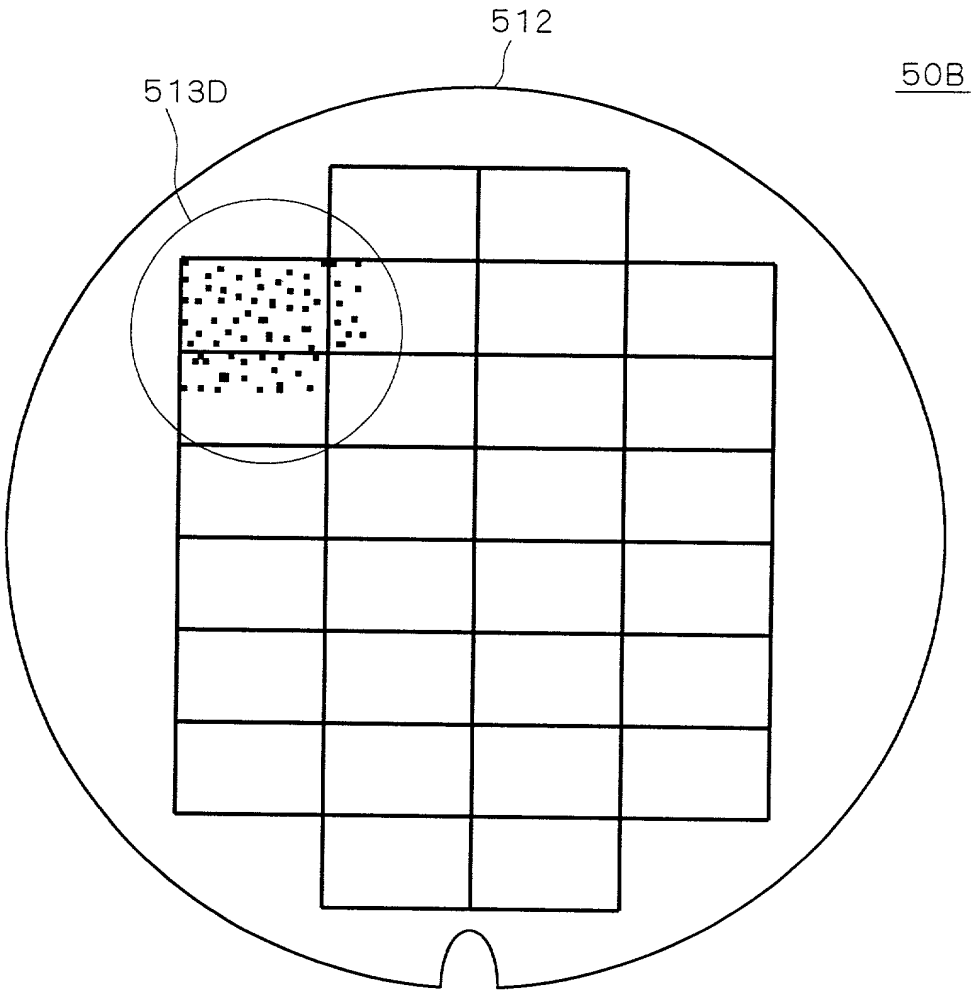
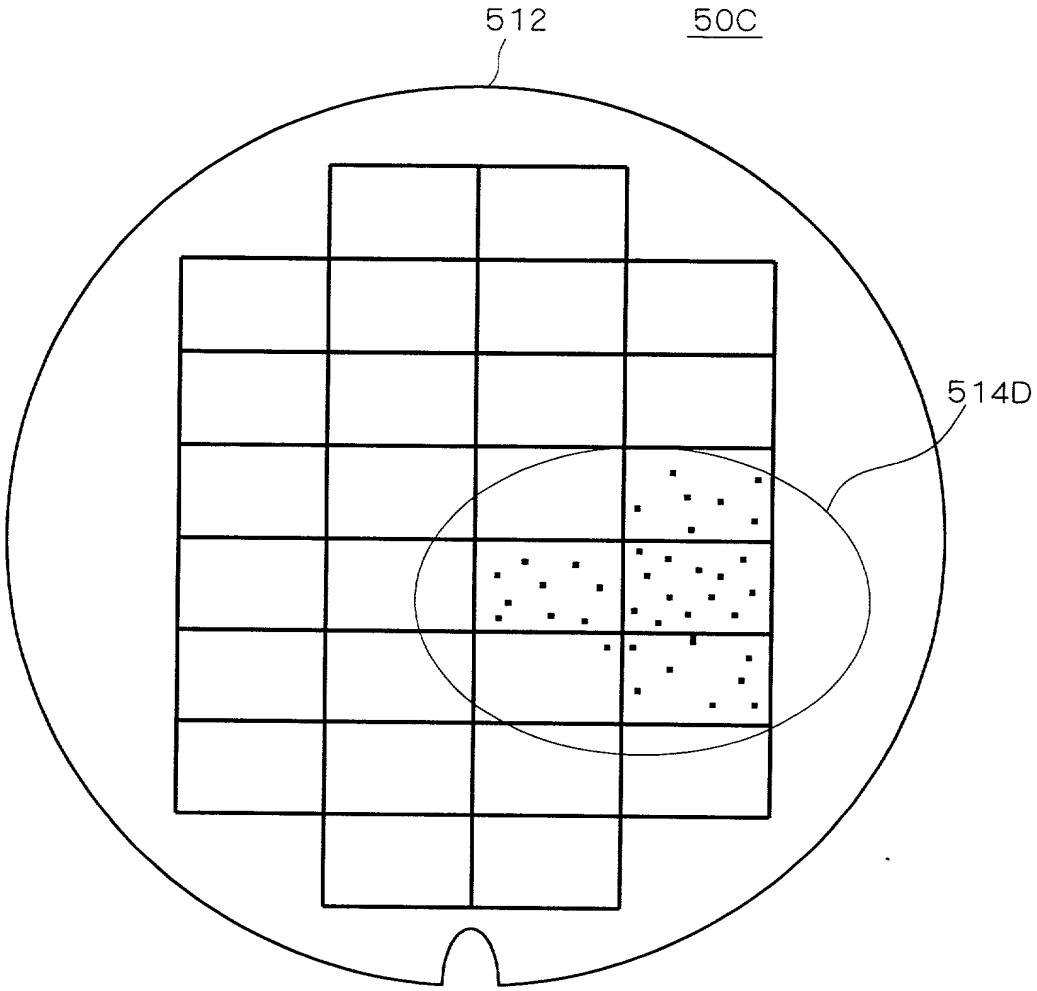
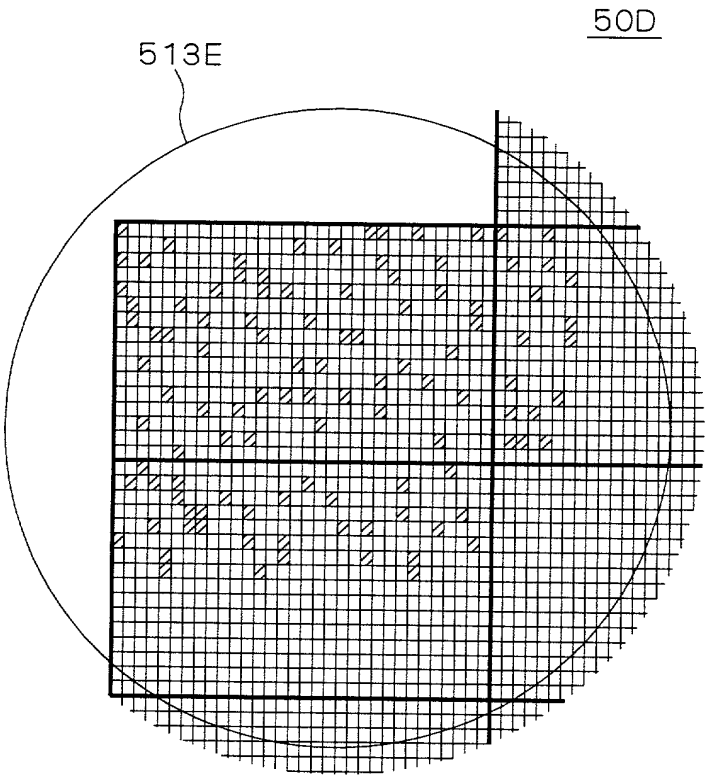


FIG. 47



SYSTEM-DRAWING

FIG. 48



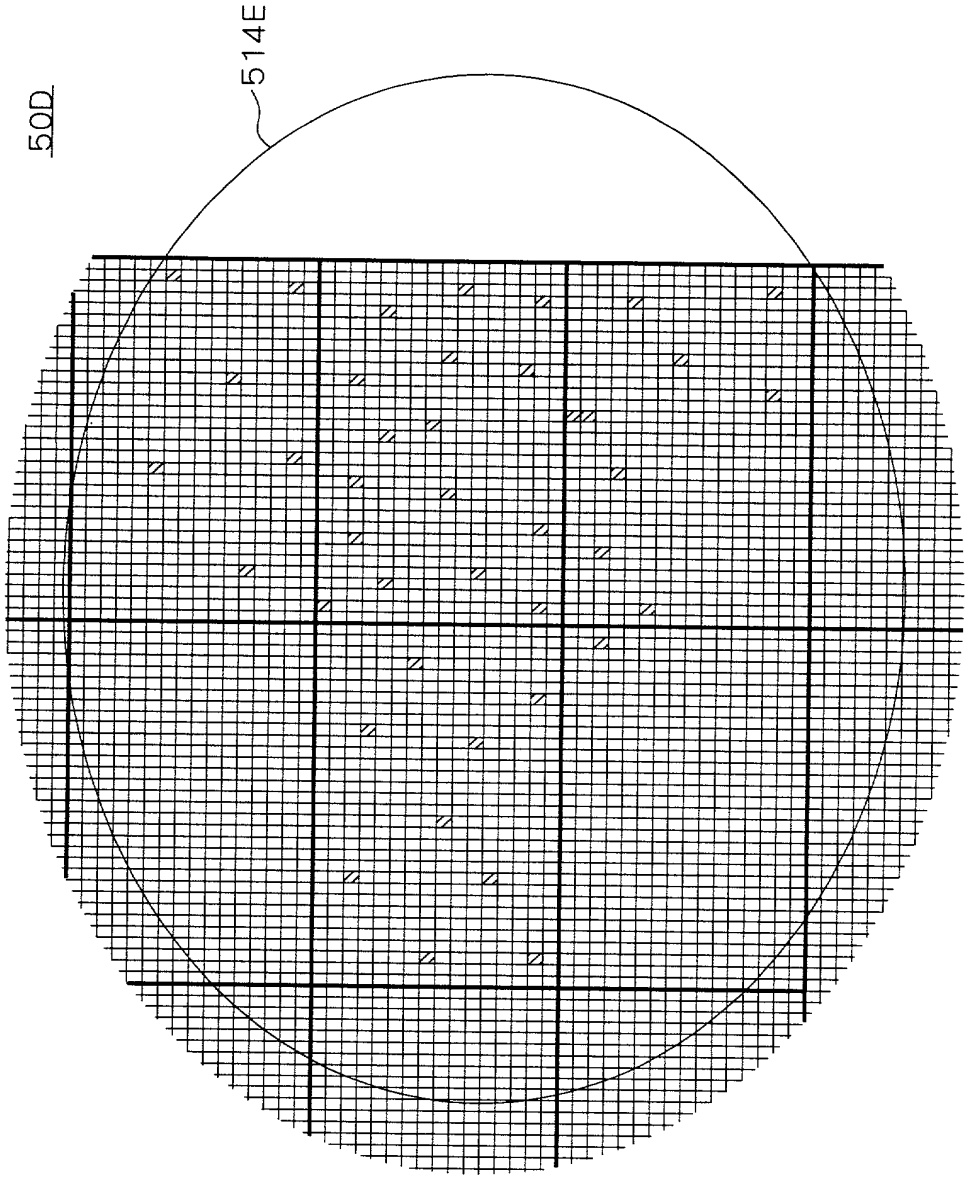


FIG. 49

FIG. 50

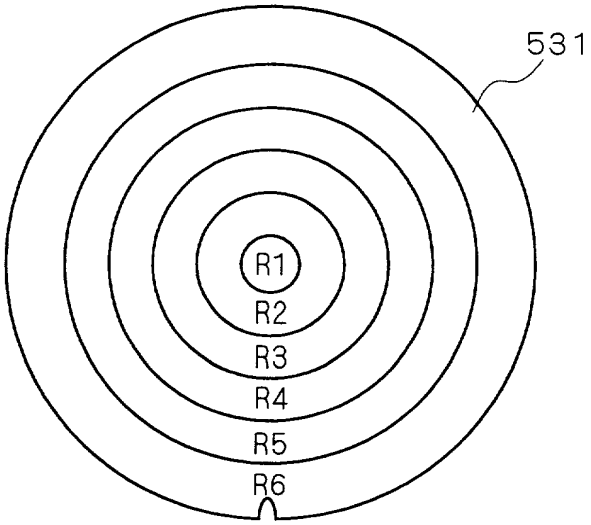


FIG. 51

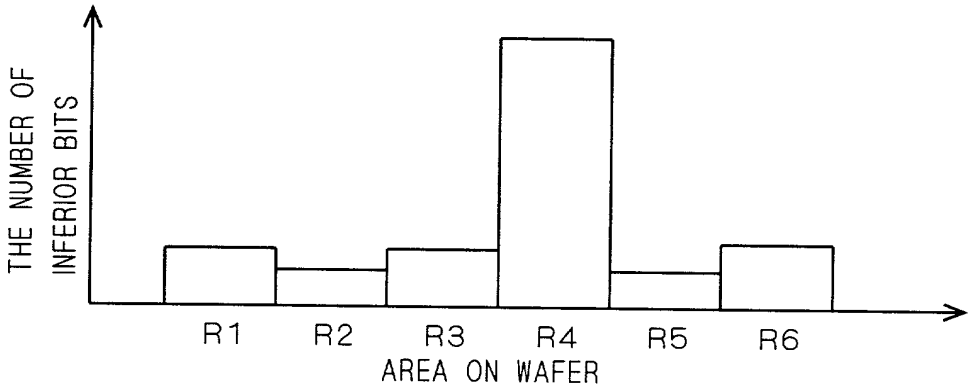
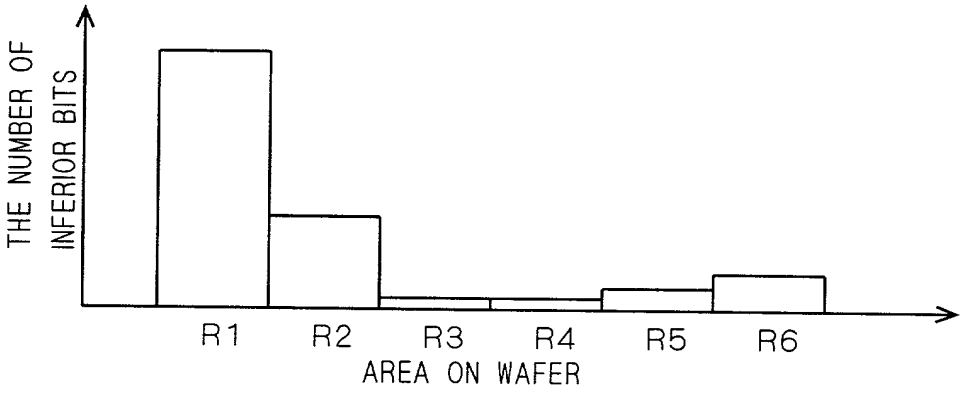


FIG. 52



US-2006-0236180-A1

FIG. 53

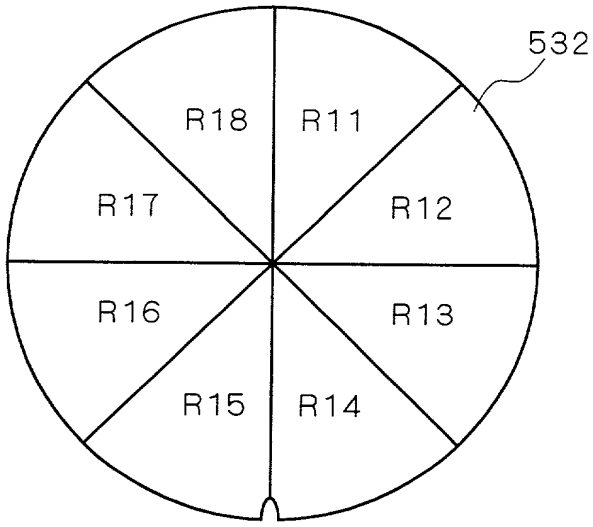


FIG. 54

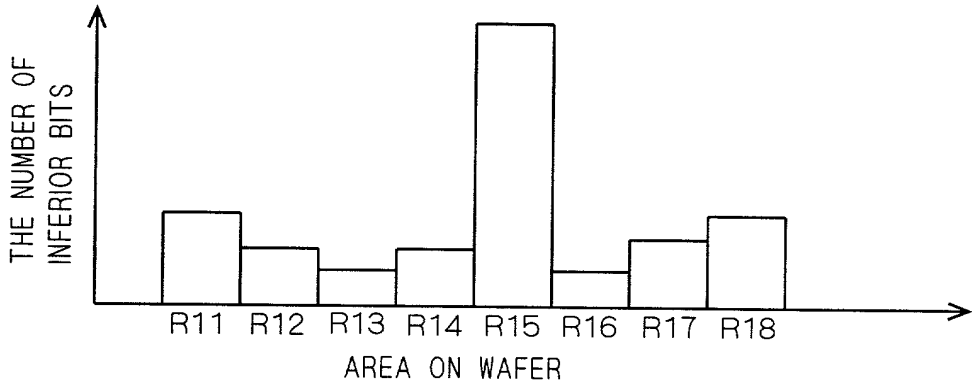


FIG. 55

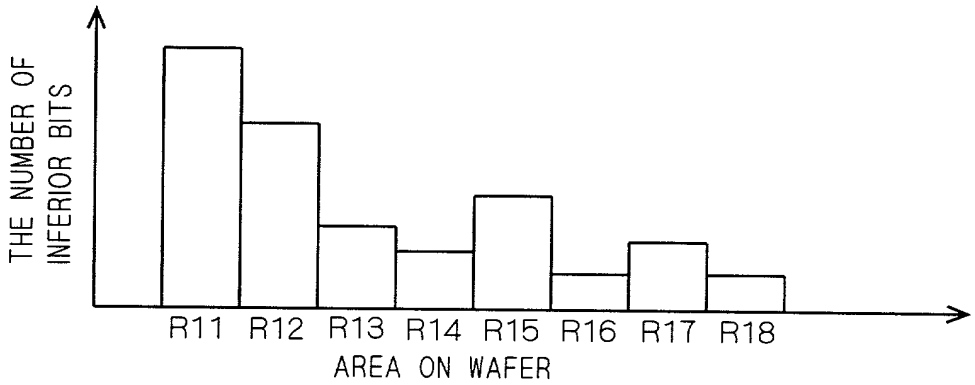


FIG. 56 (BACKGROUND ART)

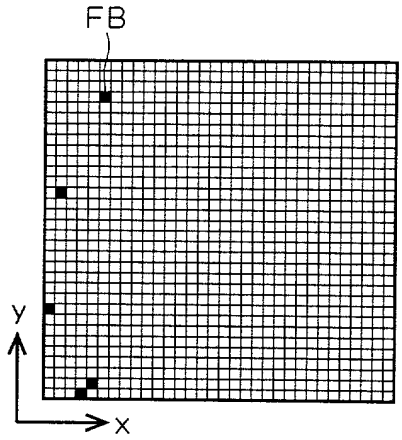


FIG. 57 (BACKGROUND ART)

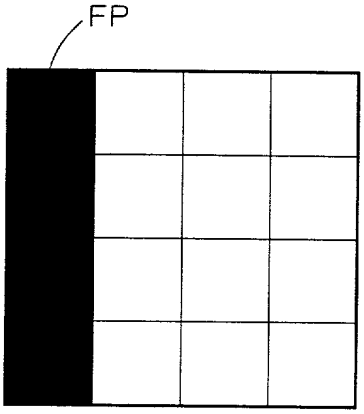
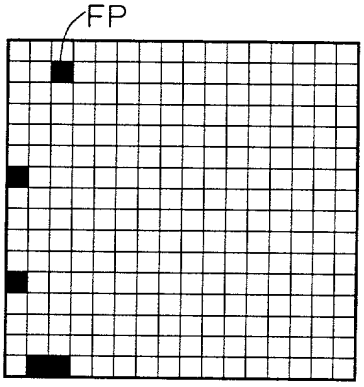



FIG. 58 (BACKGROUND ART)